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Molding Machine Practice Is Successful

Even Without Castings Recurring in Large Numbers, the Method May Be Made to Pay—Details of Equipment and Its Use

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IT is not the intention of the writer to describe anything new or startling in molding machine practice, nor to offer the best methods for machine molding. This is rather the description of a plan whereby an emergency can be met that will net the company profits, regardless of the fact that the number

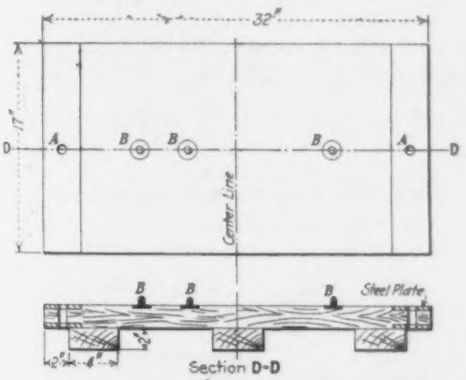

Fig. 1. Pattern Board for Molding Machine Use

of pieces to be molded is small, the patterns in poor condition and badly worn, while one pattern is used for several different parts, by minor changes, etc.

It is generally conceded that, unless there is a large number of one piece to make, the expense of fitting the patterns to molding machines will not pay. And to secure the best results from the use of molding machines, the patterns and equipment must be as nearly perfect as it is possible to make them. It is also the universal opinion of foundrymen that a foundry which is producing only a few parts from each pattern daily, on what might be termed a jobbing basis, can never be developed into a "production" shop.

In a large measure this is a mistake. While it may be true that the jobbing foundry cannot hope to get the same results as a well equipped production shop, there is no reason why the jobbing shop cannot work along the same lines, and secure a production equal to 60 per cent of that of the production foundry, rather than 25 per cent, as is usual.

We are too easily convinced that it will not pay to machine mold our castings, because the quantity ordered is small or the patterns are bad. This is our excuse for not installing machines, and while this saves the foundry executives a great deal of worry and work, the company must stand the loss, because ways and means are not devised, as is nearly always possible, to make the molding machine a success on small lot production.

The molding machine, intelligently handled, is with very few exceptions a paying investment in any jobbing foundry producing as much as 8 or 10 tons per day. True, there are many cases where this has not been proved to the satisfaction of all concerned. But a careful investigation will often reveal the facts that the method of handling the work and a desire to hinder progress along this line, were responsible for the failure, rather than a poor field for the work.

Any foundryman can successfully introduce a molding machine, and get results, if the pattern equipment and flask equipment are in first class condition. All that then remains to be done is to start some man to operate it. In cases of this kind there are always large quantities to make from one pattern, and the operator will teach himself in a short time.

The proposition we have in mind requires work and study on the part of the foundryman. Realizing this, he is often tempted to frighten his employers out of

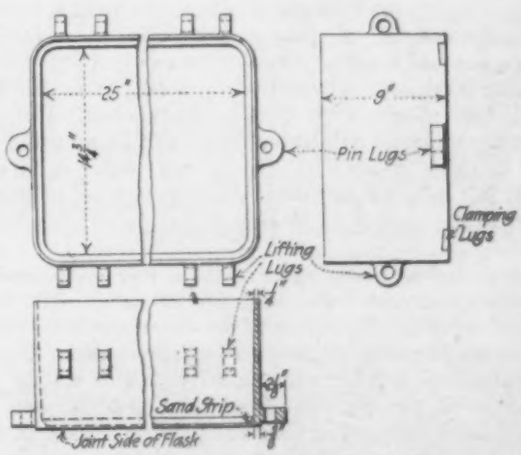

Fig. 2. Standard 16 x 24-In. Molding Flask for a Jolt Roll-Over Molding Machine

the inclination to purchase molding machines, by showing them the lack of possibilities in their shop. By comparing their work with the work that is being done in the production shop on machines, he is able to put up a very convincing argument.

Consider the company manufacturing a large number of different sizes and classes of machines, where

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the orders come in small lots, often only one machine of a kind. This makes it necessary to have many different jobs moving through the shop at one time. The question of making a quantity of these different pieces and carrying them in stock cannot be considered, because the investment would be too great. And the plant is not large enough to keep up with the regular diversified demands, and at the same time to build stock machines.

To keep pace with the machine shop, the foundry must produce a few pieces from each pattern daily, and often only one. This cuts down the foundry production on each pattern to a few per day. Some of the so-called natural-born foundrymen will at once decide that the only way to handle this work is hand molding. The owner will proceed to fill his shop with men who have

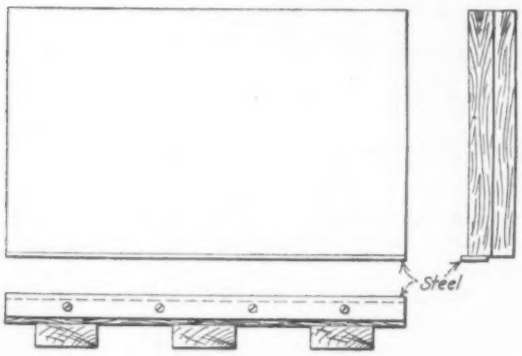


Fig. 3. Roll-Back Board

made this class of work for the last thirty years, and they will make it just as they did thirty years ago.

To meet this emergency with the molding machine, arrangements must be made to change patterns on the machines with the least possible delay. To do this several things must be considered—the size of flask to be used—the size of machine to assign to this size of flask—the number of patterns that will fit into these flasks; and last, a plan that will make it possible to switch from one pattern to another quickly, and to use poor patterns, some of which may belong in the scrap heap.

The plan we have to offer is to classify the work, not as to its character, but rather as to the size of the pieces that can be molded in a standard size flask. Each machine must be provided with the required number of flasks, all of those for one machine to be the same size and style.

For instance, a jolt roll machine will be assigned a flask that measures 16 x 24 in. inside, and all pieces that can be molded in these flasks will be produced on the machine where these flasks are used. A larger plain jolt machine may be provided with a set of flasks 42 x 48 in., enough in number to take care of a day's work.

The production on each machine will be measured by the number of flasks or molds produced. The machines using the 16 x 24 in. flasks should easily turn out 60 molds per day, of general jobbing work, with one operator, one finisher and one helper. This will be an increase of 100 per cent over hand molding, and in many cases more. The plain jolts can be worked in the same manner, and will show an equal increase in production.

In making the standard flasks for all machines, the bars for the copes must not be cast in, but, in the larger flasks, provisions should be made for putting in the bars quickly when needed, without the use of bolts. It has been proved that greater progress can be made on a large percentage of the work, with no bars in the cope or drags.

Only one standard board should be provided for each machine, this pattern board to take care of all cope and drag patterns used throughout the day. Figure 1 is a standard pattern board for a jolt roll-over molding machine. Our plan does not include the drawing of the pattern by the machine. When this board is used, the machine rams the mold, and then rolls it over and deposits it on the receiving device.

This pattern board is a good substantial board, with both ends bound with steel plates for the pin holes, and to prevent excessive wear by the flasks. The board is provided with three dowel pins, marked *B B B*, which are used to locate each pattern. Corresponding pin hole plates are located in all patterns used on the machine. Providing the patterns with these dowel plates is all that is required to fit them for a molding machine job, and thus insure a decided increase in production.

A standard pattern board, that permits the use of many different patterns, is the foundation of the method here described. This makes it possible to use a large number of different patterns daily, regardless of their shape or condition. The only requisite is that they are within the limits of the standard flask used.

Greater economy could be effected by the use of patterns that are in good condition, but we are dealing with circumstances that prohibit pattern expense. And rather than resort to hand molding methods, in vogue 50 years ago, a saving is made in the cost of molding, which could not otherwise be accomplished. Putting dowel plates in one old steam cylinder pattern may amount to one hour's work. To fit the same job to a board, so that it could be drawn by the machine, would require several days, and probably a new pattern.

Figure 2 is the standard 16 x 24 in. flask for a jolt-roll molding machine. This flask is made as light as

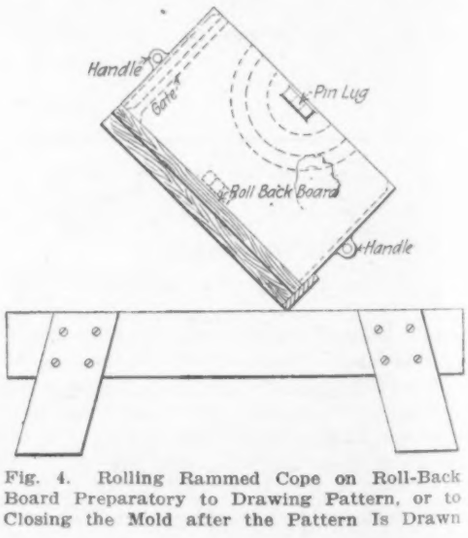


Fig. 4. Rolling Rammed Cope on Roll-Back Board Preparatory to Drawing Pattern, or to Closing the Mold after the Pattern Is Drawn

possible, as it must be carried to the floor by two men. It would slow up production to handle this flask with a crane or air hoist. Steel flasks made after this design are lighter and stronger than those of cast iron.

Note the sand strip on the joint edge on the flask, also the slight taper that helps to hold the sand in. No bars are used, which avoids swells in the castings, caused by soft places under the bars. More speed is possible without the bars, and less breakage, as the molds are shaken out very easily on account of the taper.

As handles, when cast on the flask, occupy too much space, and are often broken off, lugs on the sides are used in connection with removable lifting handles. These flasks are not rapped when the molds are shaken out, but the cope is rolled off first, making it possible to lift the flask free from the sand without any rap-

ping. The drag is shaken out next, as it is in a position to release the sand very readily.

We have used a set of these flasks for eight months without one breakage, simply because this rule for shaking out was observed at all times. The round corner increases the life of a cast iron flask at least 50 per cent. The dove-tail lugs on the four corners are used to clamp the cope and drag together, when the weight used on the cope is not sufficient to hold it down for pouring.

When flasks without bars are used, the roll-back board is necessary, to prevent the molds from falling out backwards. But in cases where very large flasks without bars are used, that must be handled with a

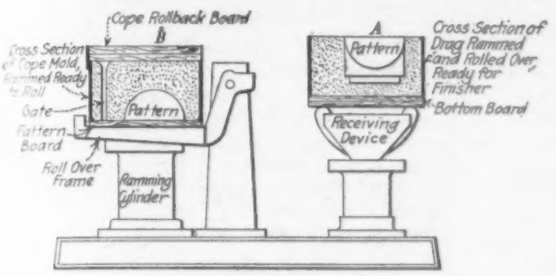


Fig. 5. Jolt Roll-Over Molding Machine Producing Work from Loose Patterns

crane, a plate is clamped over the top of the cope to hold the sand in, when the mold is rolled over. The roll-back board, Figure 3, consists of a smooth board, the same size as the standard pattern board, but without pin holes. A strip of flat steel, secured to one edge of the board, extends ½ in. above the surface, to prevent the mold from slipping when it is rolled over.

On small flasks that must be handled by hand, too much time would be consumed in clamping on cope plates, and the plates would add to the weight that must be carried by two men. For this reason the roll-back board is an important item in connection with the production of castings in the barless flask.

To use the roll-back board, after the cope part of the mold has been rammed with the machine, the sand extending above the upper limits of the flask is struck off level with a straight edge. The gate and riser pins are then withdrawn, and a smooth funnel prepared for the down gate. A portion of loose sand is distributed over the surface, and the roll-back board is rubbed down to insure an even bearing between it and the top of the cope mold.

The mold is then clamped and rolled over, and deposited on the receiving device, when it is ready to be carried to the floor by the finisher and his helper, or two helpers, as the case may be. The cope molds remain on the roll-back board, while they are carried to the floor, where they are placed on horses located conveniently near the drag molds. At this time the finisher draws the patterns, and prepares the mold for closing.

Figure 4 shows a finished mold being rolled back after the patterns have been drawn and the mold finished. When the mold has reached a position that brings the flask at right angles with the horses, the board will be allowed to drop back, as the mold in this position will not fall out. As soon as the roll-back board has thus been removed, the loose sand is blown out of the gates and risers. The cope is now ready to place on the drag.

When the finisher goes to the machine after the next drag mold, he returns the roll-back board to the machine operator. But each operator is provided with two or more such boards, to prevent delay, should the finisher be prevented from releasing it promptly, due to trouble with a mold. And in using old worn-out patterns, as is the case described here, very often the finisher is slowed up, and then must speed up when he receives the more simple pieces.

In reading the description of the use of the roll-back board the question comes to the reader's mind: "If the mold will fall out backward so easily, what is to prevent the molds from 'coping' when they are poured?" Weights must be used on the barless flasks used in this plan, the weights in many cases taking the place of clamps.

Figure 5 represents a jolt roll-over machine in operation producing work from loose patterns, at the rate of one or two from each, without the usual delay in changing pattern equipment. *A* indicates the drag part of the mold, that has been rammed, rolled over and deposited on the receiving device, ready for the finisher and his helper to carry to the proper place on the floor. There the pattern will be drawn by hand and the cores placed. *B* is the cope part of the mold, which is rammed, the roll-back board put in place, clamped and ready to roll over as soon as the drag mold is removed from the receiving device.

As the helper brings the drag patterns back to the machine operator, when he comes after the cope mold, this avoids any delay to the operator.

As soon as the jolt side of the machine is relieved of the cope mold, the operator blows off his pattern board, places the drag part of the next pattern on the standard pattern board, and proceeds to make another drag mold. In the meantime the finisher has prepared his drag, and takes the cope mold from the receiving device in time to allow the operator to roll over his new drag and deposit it on the receiving device.

These operations are continued all through the day, and good team work will secure a production that is often equal to the quantity of work made on a machine-drawn pattern. The finisher or his helper returns the cope patterns to the operator when he comes after the next drag mold, as well as any set of gates that may be in use. In cases where the operator changes his pattern, the helper places on the shelf the patterns used to make the previous mold, instead of delivering them to the operator.

(*To be concluded*)

Pump Standards Recommended

To encourage suitable standards of manufacture and engineering practice, to assist in the development of standard methods of manufacturing procedure and to develop co-operation with the customers of the pump industry, what is known as the Hydraulic Society has published a booklet, "Trade Standards in the Pump Industry." This explains trade definitions, customs of and terms used in the industry with listings of standard and extra equipment.

The society believes that the booklet will eventually be looked upon as giving standards similar to the standards established by the American Society of Mechanical Engineers. Copies of the publication may be obtained from the secretary of the society, C. H. Rohrbach, 50 Church Street, New York. F. J. Emeny, Deming Co., Salem, Ohio, is president of the society; E. B. Neal, Kinney Mfg. Co., Boston, vice-president; R. R. Hicks, American Steam Pump Co., Battle Creek, Mich., treasurer, and L. D. Albin, A. S. Cameron Steam Pump Works, New York, is chairman of the plan and scope committee.

At the annual meeting of the Falcon Bronze Co., Youngstown, Ohio, directors and officers were re-elected. The company's business is largely confined to the iron and steel industry. Production is now at the rate of 50 per cent, as compared with an average of 30 per cent throughout 1921. G. A. Doeright is president of the company; John Noll, vice-president; James L. Wick, secretary, and E. E. Miller, treasurer.

Papers for American Foundrymen's Convention

The papers committee of the American Foundrymen's Association reports that an interesting program is being arranged for the coming convention at Rochester, N. Y., June 5 to 9. Special sessions are planned for the various branches of the industry, besides an industrial relations session and a session which will be devoted to papers and committee reports on the subject of molding sand research. Some 40 papers have been promised, of which number the following have been received by the secretary of the papers committee:

"Rate of Formation and Geometric Form of Graphite and Temper Carbon," by E. J. P. Fisher, Atlas Die Casting Co., Worcester, Mass.

"Fitting Up Flask Equipment for Production Work," by Arnold Lenz, Saginaw Products Co., Saginaw, Mich.

"Technical Control of the McCook Field Foundry," by E. H. Dix, Jr., McCook Field, Dayton, Ohio.

"Aluminum and Aluminum Alloy Melting Furnaces," by R. J. Anderson, Bureau of Mines Station, Pittsburgh.

"Commercial Electric Steel Castings vs. Malleable Castings," by J. W. McKeon, West Michigan Steel Foundry, Muskegon, Mich.

"Design of Geared Ladles," by A. W. Gregg, Whiting Corporation, Harvey, Ill.

"The Behavior of Fire Brick in Malleable Iron Furnace Bungs," by H. G. Schurecht, Ceramic Experiment Station, U. S. Bureau of Mines, Columbus, Ohio.

"Electric Cranes in Foundry Service," by A. H. McDougall Whiting Corporation, Harvey, Ill.

Program for Boiler Makers' Meeting

An outline of the program of the meeting which the American Boiler Manufacturers Association will hold on Feb. 13 at Fort Pitt Hotel, Pittsburgh, has been announced by H. N. Covell, secretary-treasurer of the association, 191 Dikeman Street, Brooklyn. In brief it is as follows:

Walter Gordon Merritt, of the League for Industrial Rights, on "American Labor Policies."

Ralph M. Easley, chairman executive council National Civic Federation, on the purposes and accomplishments of that organization.

C. V. Kellogg will open a discussion on taxation.

W. A. Drake will open a discussion on "Limitation of the Field for the Use of Cast Iron Boilers."

E. R. Fish, chairman sub-committee of the boiler code committee of the American Society of Mechanical Engineers, will speak on "Welding as Applied to Boilers and Other Pressure Vessels."

Charles E. Gorton, chairman American Uniform Boiler Law Society, will give an account of the operations of that organization to date and will be prepared to answer questions in connection with the National Board of Boiler and Pressure Vessels Inspectors, particularly as applied to stamping and filling in the data sheets for boilers.

Answers to the recent questionnaire on wages have been received in sufficient number to warrant a tabulation.

British Institute of Metals

The annual meeting of the Institute of Metals will be held in London, England, March 8 and 9, when 10 important papers are to be presented for discussion. The annual dinner will be held at the Trocadero restaurant on Wednesday, March 8.

The annual May lecture will be delivered on May 3 by Sir Ernest Rutherford, F. R. S. on "The Relation of the Elements." The discourse should throw fresh light on the much debated subject of the possible transformation of one metal into another. The autumn meeting will be held—for the first time—at Swansea, Wales, Sept. 20 to 22. A large gathering is expected in this important metallurgical center.

In view of the attractive nature of the program for the ensuing year it is expected that the growth of the institute in 1922 will be even greater than it was last year, when the membership increased from 1298 to 1410—a record year's growth. Such an increase, occurring during a year of great trade depression, indicates that makers and users of non-ferrous metals and alloys are now more than ever on the alert to take advantage of the scientific information obtainable through association with the institute that exists to foster their interests.

The Institute of Metals has just issued a practical pamphlet of 32 pages given in summary form the results of over 10 year's research into the causes and prevention of corrosion in condenser tubes. The pamphlet, which is one that will appeal particularly to all engineers, can be obtained, price 2s. 8d. post free, from the Institute of Metals, 14 Members' Mansions, London, S. W. 1.

Steel Club Dinner

The Steel Club of Philadelphia held its mid-winter dinner at the Bellevue-Stratford Hotel Friday evening, Feb. 3. H. E. Resch, of the Whitehead & Hoag Co., Newark, N. J., delivered an address on "Shakespeare As a Salesman." Aldrich W. Stein, a hand writing expert, delivered a stereopticon lecture on "Forgeries and How the Hand Writing Expert Discovers Them." Several solos were sung by L. V. Geist of the Donner Steel Co.'s Philadelphia office.

National Metal Trades Convention

The program of the annual convention of the National Metal Trades Association to be held at Hotel Astor, New York, April 17 to April 20, inclusive, provides for the executive committee meeting, a meeting of local branch secretaries and a dinner of local branch secretaries will come on Monday; the administrative council meeting, a meeting of local branch secretaries, and the so-called alumni dinner on Tuesday, leaving for Wednesday and Thursday the convention proper. A buffet luncheon will be held as usual on Wednesday, with the banquet in the evening.

New England Foundrymen's Association

Edwin S. Carman, secretary and chief engineer of the Osborn Mfg. Co., Cleveland, gave an illustrated talk on "The Application of Molding Machines to Miscellaneous Castings Production" before the New England Foundrymen's Association, on Wednesday evening, Feb. 8, at the Exchange Club, Boston. While Mr. Carman discussed the application of the molding machines to miscellaneous production, he also showed the advantages gained by the use of the same machine in quantity production. At a dinner preceding the talk, E. H. Ballard, newly elected president of the association, presided.

February Meetings of Association of Iron and Steel Electrical Engineers

At Cleveland, Feb. 13, a paper will be read on "Gaseous Fuels and Their Use in Iron and Steel Plants."

At Pittsburgh, Feb. 18 there will be a paper on "Departmental Organization and Education."

At Birmingham, Feb 25, the subject of "Operation of Frequency Changers" will be discussed.

Standardization Making Progress

WASHINGTON, Feb. 7.—Subcommittees of the National Screw Thread Commission have begun consideration of questions relating to the standardization of bolt heads, nuts, wrench and drill and tap sizes and hope to report at the next meeting of the commission about March 1. Provision for extending for five years the term of the commission was made in a bill which recently passed the House, and Senator LaFollette having concluded to report favorably on it, there will be no hearings before a Senate committee.

Plant Makes Upset Forgings Exclusively

New Shop of Amforge Co. Is Unique Because of Its Equipment, Layout and Methods of Stores Keeping—Ventilation a Feature

RECENTLY completed at Chicago, the plant of the Amforge Co. is unique in that it is the only forge plant in the world devoted exclusively to the manufacture of upset forgings. This process of forging is practically in its infancy. Less than ten years ago, forging machines were principally used for flanging crankshafts and for preparing stock preliminary to work under hammers. During the last few years, however, the new method of forging has developed rapidly until it is estimated that 250 upset forging machines are now operating on commercial forgings, finished complete and ready for machining.

In conjunction with the use of upsetting machines, the Amforge Co. has introduced improved methods of die making and steel gathering, which enable it to produce transmission gear parts requiring the utmost strength, which, it is asserted, show far better physical properties than hammer forgings. The company's practice calls for round bar steel of forging quality, closely inspected for seamy stock. The bar is always forged horizontally, and forced into the dies by the headers in two or three operations. In the drawing is shown a stem pinion after the first and last operations. It will be noted that the grain of the steel in the finished pinion is such that teeth will be cut against it.

Drop hammer gears, on the other hand, are made from flats, billets and rounds—whichever is best adapted for the piece—and often little attention is given to controlling the grain of the steel, so that on some gears the teeth at one point are against the grain, while at another point they are with the grain. It is also claimed, as an advantage for the upsetting method, that it does not tend to crystallize the steel, while drop forging often does produce that effect.

While the equipment of the Amforge plant includes two large Chambersburg steam hammers of 2000 lb.

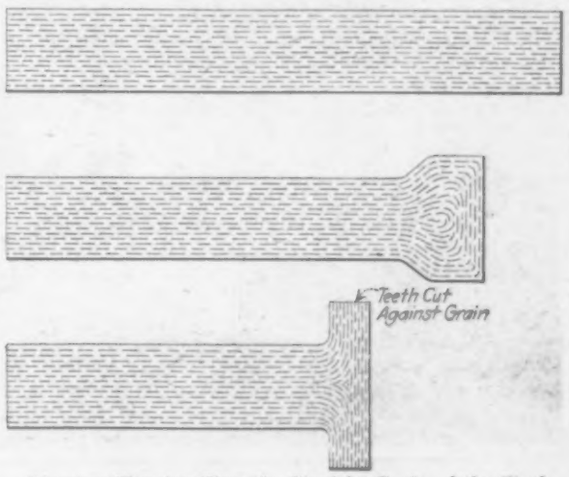


Diagram Showing How the Straight Grain of the Steel Bar Is So Changed in the Upsetting Process That Teeth May Be Cut Against It

and 3000 lb., respectively, these are utilized in connection with the manufacture of dies. All finished forgings are made in the upsetting machines, each driven by an individual motor. The arrangement of

Interior of Main Shop Before Heavy Upsetting Machines Were All Installed

the main shop in relation to incoming and outgoing materials, the character of the material handling equipment, the methods employed to keep track of stock throughout all stages of manufacture, the manner of storing and disposing of scrap—all bear the earmarks of a thorough survey of the many-sided problems encountered in working out a plan for maximum economy in production.

The main forge shop, 80 x 420 ft., is served by a Niles 10-ton overhead traveling electric crane, operated from the floor. This crane is used chiefly for assembling and dismantling the heavy equipment. For handling material to and from the machines, storage battery elevating trucks are used, with a capacity of 4000 lb. each. These trucks, furnished by the Elwell Parker Electric Co., Cleveland, operate over concrete aisles provided throughout the shop.

The forge shop is divided into two units, one containing the larger and the other the smaller machines. Between the two departments, a 20-ft. concrete aisle leads directly to the shipping, inspection and heat treating rooms. Sixteen upsetting machines, staggered throughout the length of the shop, alternately face opposite sides of the building. Fifteen were built by the Ajax Mfg. Co., Cleveland, and the other by the National Machinery Co., Tiffin, Ohio; there are four 3-in., six 5-in. and six 7-in. machines. Each forging machine is served by hot saw and burring machines for cutting off and smoothing forgings, and with oil forgings for heating the bar stock to working temperature. A General Electric motor-driven 75-hp. blower, delivering 6200 cu. ft. of free air per min. at 2 lb. per sq. in. pressure, furnishes the necessary air for fuel oil combustion.

The receiving side of the building is served by a siding from the Chicago, Burlington & Quincy Railroad. Between the siding and the plant is a stock yard commanded by a 10-ton Milwaukee Electric Crane & Mfg. Co. crane, of semi-gantry type. One end of the crane is supported by a leg which runs on a rail laid on the ground, while the other end runs on an overhead runway attached to the side of the building.

To every bundle of incoming forging steel is attached a lot-number ticket, on which is recorded the asset account to which the material is charged, the lot number and the analysis of the steel. For example, a card carrying the designation "Sam Lot No. 54, 55/70 carbon" would indicate that the carbon ranged from 0.55 to 0.70 per cent, and that the material was charged to the Sales Merchandise account. The classification "sales merchandise" includes all material purchased for production uses, which eventually is included in sales invoices to customers. Material bought for the repair or renewal of the physical property of the plant is classified as "repair merchandise," the symbol of which is "Rem." All material which passes through the stores department and which is eventually used through requisitions, but cannot be classified under sales or repair merchandise, is put into the "supply merchandise" account, the symbol for which is "Sum."

Corresponding to each store yard ticket is a storekeeper's record card, on which are registered not only the lot number, the steel analysis and the symbol of the account to which the material is charged, but also the name of the company from which the material was bought, the weight of the bundle, the number of bars it contains, and their size and length. Each bundle of steel retains its lot number until all of it has been disposed of. Requisitions against a bundle are recorded on the stores card, so that at all times the storekeeper has an accurate check on unused material in stock.

Careful record is kept of the weight of material used for specific orders. When the manufacturing department receives an order for a certain lot of forgings, and is ready to make out a material requisition on the stores department, it first figures out the cutting length of the stock required to make the finished forging, and then computes the standard bar length to use to obtain these cutting lengths with the least waste, the number of bars required from the stock yard to fill the order, and the theoretical weight thereof. All of this information is recorded on the requisition and, in addition, the purpose for which the material is to be used is specifically stated. Upon receiving the requisition, the storekeeper picks up from the yard the number of bars of the specified size, and weighs them on a Standard Scale & Supply Co. rolling mill scale, whereupon he enters the actual weight on the requisition, adjacent to the theoretical weight previously recorded. The weighing of material before it enters the manufacturing department, as well as before shipment in finished form, is rather unusual, but is an aid to accurate cost keeping.

Skid rails extend from the storage yard into the stock cutting room, which is a lean-to to the main forge shop. Here are located a No. 4 guillotine shear, made by the Hilles & Jones Co., Wilmington, Del., and a Higley cold saw furnished by the Vandyck Churchill Co., New York. The shear has a capacity for 4-in. rounds, and for angles up to 6-in. x 6-in. x ¾-in. The Higley cold saw is used to cut steel used for headers, which may run as high as 0.80 or 0.90 per cent carbon, and cannot be handled on the guillotine shear.

Elevating Trucks Bring Forging Boxes Containing Finished Product into Inspection, Grinding and Shipping Room

Crane Sliding Stock Across Skid Rails into Shear Room. Elevating trucks move material, stand and all, as shown

Steel is handled direct from stores to the shear room without reloading. No narrow gage or industrial tracks are used. After the material is weighed and placed on the skid rails, it leaves the hands of the storekeeper and passes under the authority of the manufacturing department.

Shipping, inspection and heat-treating departments are located in a building adjacent to the main forge shop, but separated from it by a 10-ft. areaway, so that air for ventilating purposes is provided on that side. In the heat-treating department are four double-end Tate-Jones & Co. annealing furnaces, served by two water quenching tanks, one at each end of the furnaces. The furnaces are of the car-type, and forgings are handled to and from the cars, and into and out of the quenching tanks, by a Yale & Towne one-ton electric hoist. The furnaces are equipped with a temperature recorder furnished by the Wilson-Maulen Co., New York.

In the adjacent grinding and shipping room are two W. W. Sly Mfg. Co. tumbling barrels, used to remove scale from carbon steel forgings. Flashings and all rough edges are taken off on grinding machines, there being six double grinders, operated from a line shaft. For drilling automobile hub forgings and other similar work, three "Hole Hog" drills, furnished by the Moline Tool Co., Moline, Ill., are used. Other equipment includes a Toledo trimming press, and a cutting-off machine furnished by the Modern Machine Tool Co., Jackson, Mich. A 10,000-lb. Toledo springless scale weighs all material leaving the shipping department.

The forging boxes, in which finished material is brought into the shipping room by the elevating trucks, have bottoms constructed of open pipes. This permits dust and dirt to fall through to the floor, while the passage of air through the pipes serves to cool the forgings. The tare weight of the trucks is checked every morning and the box weights are also checked periodically; thus the shipping weight is obtained by subtracting the weight of the truck and box from the total weight. The shipping platform, of concrete, is served by a railroad siding. A loader manufactured by the Barber-Greene Co., Aurora, Ill., is used to transfer heavy forgings from the shipping platform to cars.

Adjoining one end of the main forge shop is the

Upsetting Machines and Oil Furnaces Alternate at Right. In center are a hot saw and a burring machine, with smaller equipment in foreground

machine repair shop and die storage. The machine shop, used largely for maintenance work and for machining dies and headers, contains some large equipment, including a Niles-Bement elevating table horizontal boring mill, a 60-in. Bement drill press, a Cincinnati Planer Co. widened pattern 48-in. x 60-in. x 14-ft. planer with four heads and self-contained motor drive, a Niles-Bement-Pond 42-in. x 42-in. x 10-ft. planer with two heads and self-contained motor drive, a Fifield-Wright 60-in. x 15-ft. triple-geared into face plate engine lathe, a 26-in. x 15-ft. Walcott engine lathe, a 26-in. x 24-ft. Walcott engine lathe, and a 25-in. x 10-ft. LeBlond heavy duty engine lathe. besides other miscellaneous machines. The shop is served by a Whiting 10-ton overhead hand-power crane.

All dies and headers are stored in the die department, arranged in numbered compartments by jobs, corresponding numbers being recorded in the storekeeper's records. The storing of the dies and headers not only enables the company to take care of repeat orders, but permits it to serve its entire trade more expeditiously and economically. When new orders are received, suitable dies and headers may often be found in stock, thereby obviating the necessity of having new ones made. The die storage is commanded by a 3-ton Whiting overhead hand-power crane.

An excellent system for taking care of scrap has been installed. Throughout the forge shop, the machine shop and the trimming room scrap buckets are placed to catch waste stock. The buckets, which were designed by the company, are lifted and carried to the steel storage yard by elevating truck. Here four chains joined together at one end in a permanent loop are fastened to four holes in the top of the bucket. For this purpose the last link in the free end of each chain is a U-link, through which a cotter pin is inserted after the chains are fastened to the bucket, by a hook from the overhead yard crane, inserted into the lifting loop, the bucket is conveyed to a scrap yard located adjacent to the railroad siding. Here the different kinds of scrap are dropped into separate bins, from which they may be loaded into cars for shipment.

Electricity is used for power throughout the plant, except for the steam hammers. Steam for the hammers and in cold weather for heating the oil storage tanks and the trenches carrying the oil pipes, is furnished by a coal-fired 200-hp. horizontal tubular boiler, built by the Brownell Co., Dayton, Ohio.

Fuel oil for the furnaces is supplied from three concrete storage tanks set in the ground between the steam hammer room and the heat-treating department. Tank cars, spotted on a track adjacent, are connected to an intake pipe through which the oil passes to the tanks. Three control valves permit passing the oil into any tank desired. Calibrated standpipe gages indicate the oil level in each tank.

The ventilating system used in the forge shop is unique. Instead of bricking up from the ground level to the window sash elevation, this space has been fitted with swinging doors. Thus all heat, smoke and heavy gases on the floor level, which often remain inert under other ventilating systems, are carried up to the roof and drawn out of a V-shaped monitor. Regulation of the monitor windows is handled in accordance with the direction of the wind. By opening windows on the "lee" side of the building, advantage is taken of the partial vacuum formed on that side, thereby insuring a draft which will exhaust the air rising from the floor of the shop.

Construction of the ground level doors is such as to insure the least possible interference with the circulating system. The doors are pivoted half way between the bottom and top and are swung with the top out. Hence any piles of material, adjacent to the doors outside the building, will not obstruct the inflow of air. It will be noted that the angle of the door, when opened, is upward in relation to the exterior of the building, and air can enter from higher elevations through the openings provided, both above and below the axis of the door.

FEWER IRON AND STEEL WORKERS

Gain in Employment Halted—General Industry Busier

WASHINGTON, Feb. 7.—The increase in employment in the iron and steel industry which set in last August gave away for the first time since then in January, when there was a decrease of 7130 workers, or 0.21 per cent under December, according to the January bulletin of the Employment Service of the Department of Labor. Employment by the 1428 firms reporting to the Service, however, showed an increase of 63,400 employees, or 4.2 per cent, over Dec. 31. Besides iron and steel, other industries showing decreases were textiles and their products, 949; railroad repair shops, 2387; tobacco manufactures, 803; stone, clay and glass products, 149, and lumber and its manufacture, 74. The total decrease in the six industries was 11,492. Increases in the remaining eight industries reporting were as follows: Vehicles for land transportation, 63,204; leather and its finished products, 2089; metals and metal products, 2254; paper and printing, 132; food and kindred products, 2319; miscellaneous, 4286; liquors and beverages, 10, and chemicals and allied products, 598, a total of 74,892. The firms reporting employed 1,493,107 workers on Dec. 31, as against 1,556,507 on Jan. 31.

Of the 65 cities from which reports were received, 40 showed employment increases in January. Detroit led with an increase of 89 per cent. Among iron and steel centers showing gains were Cleveland, 7 per cent; Chicago, 4 per cent; Toledo, Ohio, 3.7 per cent; Pittsburgh, 0.5 per cent and Youngstown, Ohio, 0.5 per cent. Among iron and steel centers of the 25 cities showing decreases were the following: Johnstown, Pa., 14.1 per cent; Philadelphia, 8 per cent; Buffalo, 6.7 per cent; Birmingham, Ala., 6.2 per cent; Columbus, Ohio, 3.3 per cent; Cincinnati, 2.9 per cent and New York, 1.8 per cent.

Commenting on employment conditions, Director Francis I. Jones of the Employment Service says:

"Employment conditions fail to give any indication of the substantial improvement in business activities predicted for January. The figures last month were obtained during inventory period, particularly those in the automotive industry. The slight change in the totals of all the groups shows a downward trend. Textiles and iron and steel, which have been on the upward swing for some months past, show a downward tendency in employment for the past thirty days. Railroad repair shops continue to decrease their forces. Increase in employment in metal products other than iron and steel, and in miscellaneous industries, is the encouraging feature of this month's survey.

"Reports from 231 of the principal centers show no general improvement in employment conditions. Industry is hardly holding the gains made during the past four months, and is, therefore, absorbing few, if any, of the workers released from seasonal activities and the unemployment caused by the usual climatic conditions of this season of the year. The feeling that there will be a decided change for the better by early spring is manifested by every section of the country, and seems to be based on real evidence of prosperity, and not mere optimism."

Electrical exports for the calendar year 1921 are reported by the Department of Commerce at $97,935,597, compared with $102,870,434 in 1920. Chief among the items recording losses were batteries, interior wiring and fixtures, magnetos and spark plugs and electric locomotives. Increases were made in motors, telephones and transformers. The entire loss took place in December, for eleven months showed $89,039,404 in 1920 and $92,758,321 in 1921.

Steel Pipe by the Centrifugal Process

Methods and Cost of the Cammen Process for Making Seamless Pipe at Low Cost—Competition with Welded Pipe

BY L. CAMMEN

THE publication of some data on the Cammen process of centrifugal casting of steel pipe has brought in so many inquiries, particularly as to the cost and patent status, as to make the following statement desirable.

First, as to patents: Centrifugal casting is quite old, and all the basic patents relating to casting in a chill, sand or clay mold expired many years ago. There are a number of patents on minor details such as pouring spouts of various construction, mold supports, etc., and it would be advisable for anyone who intends to go into this line to make sure that he does not involuntarily infringe on one of these patents. The fundamental features of the process are, however, free to all, and there is no reason why any good engineer familiar with the art should not be able to build a workable unit without getting into legal trouble. This does not apply, however, to processes using the hot mold.

Why a Hot Mold Must Be Used

When an ordinary steel casting is made, be it from a pattern or in an ingot mold, provision is made for the escape of gases to the top of the casting by means of a head or riser. In fact, in casting ingots special precautions are taken, such as dozzling, to keep the top of the ingot hot long enough to take up the gases and feed the contraction cavities. In a centrifugal casting there is no head or riser and the entire metal freezes uniformly throughout its length.

When the metal is poured into a cold mold, that part of it which comes into contact with the cold walls freezes at once. Theoretically in centrifugal casting, all slag and material containing dissolved gases should be thrown to the inside but, because of the high viscosity of molten steel, this takes an appreciable amount of time so that, unless the metal freezes very slowly indeed, the gas and slag particles are trapped in the cast pipe, which is then worthless.

The controlling question is therefore the time that it takes the metal to chill, which is the reason why, for example, good centrifugal castings in a cold mold have been produced in sizes of 12 in. diameter and ½ to 3½ in. wall, but all attempts to make good smaller casting, say of 6 in. diameter and with 0.280 in. wall, have failed; there was not enough metal in the latter case to keep the heat long enough.

In the Cammen process an extremely hot mold, as high as 2000 deg. Fahr., is used. Metal cast against a mold of such temperature cools so slowly as to give time to throw all slag and gases to the inside, and perfect castings have been obtained in sizes as small as 3 in. outside diameter, with a ⅛-in. wall not only in steel but in such a difficult metal to handle as Monel. The use of the hot mold is covered by broad claims in patents either issued or allowed.

Manufacturing Methods

One of the important features of the centrifugal process of casting is the great output per unit of spinning bench. Thus, the final designs have shown that a pipe, 16 ft. long, can be cast every 5 to 6 min. At the same time, however, such a pipe weighs only, in standard 6-in. size, about 300 lb. It is, therefore, a proposition involving a comparatively small amount of metal at short intervals, and as such is admirably adapted to the employment of the small (6-ton) Bessemer converter, in batteries of two to three, feeding to sets of spinning benches handling various sizes of pipe.

The equipment of a plant consists, therefore, of the following: First, a furnace to heat the molds to the proper temperature. This does not differ materially from the furnaces now used in seamless tube mills for heating billets preparatory to piercing, with the only difference that better facilities for handling the molds have to be provided, as a mold weighing anywhere from 3 to 6 tons has to be rapidly shoved from the furnace into the spinning bench, and as the mold has to be carried in a cradle so as not to be distorted in handling and not lose heat too fast. These details have been fully worked out, however.

From the furnace the molds go to the spinning benches, which are simply rotating barrels with means to hold the molds centrally. They have to be built very substantial, but their cost is quite moderate. Thus, a unit to make 6-in. pipe, 16 ft. long, costs less than $10,000. After spinning, the pipe is shaken from the mold and, while still hot, is sent through one pass of a hot rolling mill to make the surfaces perfectly smooth. As a matter of fact, if the metal is fairly clean, both the outside and the inside surfaces of centrifugally cast pipe are fairly smooth; as the amount of metal poured cannot be controlled to within very close limits in commercial operation, centrifugally cast pipe can be sold only by the outside diameter.

When alloy steel is made, the pipe has to be subjected to proper heat treatment. Instead of a regular rolling mill, a sizing machine may be used; at the same time, however, pipe made for many purposes may go out just as cast.

Cost of Centrifugally Cast Steel Pipe

Costs of this process differ, of course, with the producton schedule, but the following estimate applies to a mill making each day not more than four sizes, with a total output of not less than 40 tons per hour. This schedule applies to standard pipe; extra strong is about 15 per cent cheaper, and double extra strong about 20 per cent cheaper. All costs are per ton of 2000 lb.

Metal	$15.00
Mold (deterioration and treatment)	5.00
Heating the mold and handling	4.00
Labor (not including converters)	2.00
Inspection and supervision	1.00
Sizing	5.00
Varia	3.00
Royalty	5.00
Total cost per net ton at mill door	$40.00

The costs of alloy steel pipe are naturally a good deal higher because of the higher cost of the metal, and the additional handling, such as heat treatment, straightening, etc.

Seamless pipe is, however, not only cheaper than welded, but has certain advantages over this latter which are so obvious as not to need discussion.

Centrifugally Cast Pipe and Oil Country Trade

To-day, the vast region known as the West and South is supplied with pipe from the Pittsburgh-

Youngstown-Chicago territory, because the cost of a pipe mill is such that it does not pay to set it up except for a large and steady output. But a plant for centrifugal pipe casting costs comparatively little, and even though a small plant cannot yet (the art is, however, young, and economies may be developed) make pipe at the above price, even at $50 a ton as a "production price in Oklahoma," Pittsburgh and Chicago mills will have severe competition, especially considering present freight rates.

Corporation and Merger Compared

This throws, by the way, an interesting light on some facts connected with the proposed merger of independent steel mills. As matters stand to-day, steel pipe is one of the most active products in the industry, and promises to remain so for some time. Of the country's capacity, roughly 3,400,000 tons, the National Tube companies control 1,350,000 tons, and the proposed merger 1,115,000 tons. As the two have an ingot capacity respectively of 22,000,000 and 6,500,000 tons, it appears that they convert into pipe respectively 7 and 18 per cent and, in dollars and cents, pipe business means to the Steel Corporation roughly 10 per cent, and to the merger 25 per cent.

Though never formally stated, it is plain that the merger if formed will be primarily for purposes of competition with the Steel Corporation. As far as pipe is concerned, the merger will have the slight advantage of location as far as Southern and Western trade is concerned, but the corporation can cut prices deeper than the merger, partly because of its stronger financial position generally, and partly because, as seen from the above figures, it is less vitally interested in the pipe business.

Furthermore, the corporation has a more fully rounded out line of products, as it makes seamless tubing which the merger does not. And yet, with 25 per cent of its business in tubular goods, the merger has to make good in this line or it will have a difficult time in holding its own in other lines.

From this point of view, it is quite likely that the development of a radically new process of pipe manufacture, capable of delivering seamless steel pipe at something like $40 per ton would in itself be a powerfully disturbing element. If to this be added the fact that the cost of the plant is such that it would pay to install units all through the country and thus take advantage of the present high freight rates, it will be no exaggeration to say that we may look forward to lively times in the steel pipe business.

At the same time, it must be clearly realized that a material cut in price of pipe at the present time would be highly beneficial by increasing the demand for it, and thus helping the steel industry generally. Also, availability of alloy steel pipe, in particular nickel and chrome-nickel steel pipe, will be of considerable advantage to the oil industry and in hydraulic installation work, which in its turn may create an increased demand for pipe.

To what extent welded pipe may continue to find a market in the face of a competition of seamless pipe at a maker's cost of $40, and possibly less, per ton, remains to be seen. A big industry is not, however, wiped out at a moment's notice by the appearance of a new process or article.

ORE SHIPMENTS

Superior Total Falls Short of 23,000,000 Tons—Light Movement By Water and Rail

Statistics collected by the *Iron Trade Review* show that the total of iron ore shipped from the Lake Superior district in 1921 was 22,799,077 gross tons, or 43,859,389 tons less than the total, 66,658,466 tons, shipped in 1916. The record of these two years in the ore trade represents the two extremes in the effect of the war and its aftermath. The total in 1916 was the largest ever attained in the Lake Superior district. That of 1921 was the smallest in 17 years.

Four-fifths of all the iron ore that has been shipped from the Lake Superior district has been forwarded to the blast furnaces since 1901. In this period the average yearly shipment has been 40,870,843 tons. The tonnage of 1921 was 44 per cent below this yearly average.

Including the mine at Mayville, Wis., operated by the Steel & Tube Co. of America, and which produced 52,709 tons of ore in 1921, the total number of mines in the Lake Superior district from which ore was shipped in 1921 was 149. In 1920 the number was 237; in 1919, 240 and in 1918, 284. In 1916, the year of the maximum shipment, the number was 233.

The Oliver Iron Mining Co., subsidiary of the United States Steel Corporation, shipped 14,056,759 tons of ore from the Lake Superior district in 1921, as compared with 24,936,073 tons in 1920. The total in 1921 was 61.65 per cent of all the ore shipped, while the general average for the preceding 12 years was about 46.50 per cent. The company's proportion of the total last year was the largest it ever attained; while the amount of ore it shipped receded to practically the same figure as of 1908—14,123,957 tons. Only one new mine was opened in the lakes district in 1921, and this, on the Cuyuna range. The Maroco, of the Marquette Ore Co., developed into a shipper of washed concentrates, forwarding 6596 tons during the season, the bulk all-rail to St. Louis.

Shipments by Port and All Rail, Gross Tons

	1921	1920	1919	1918	1917
Escanaba	1,806,656	7,361,070	4,963,358	6,774,969	7,156,854
Marquette	786,946	3,415,108	2,132,935	3,457,054	3,207,145
Ashland	2,264,705	8,180,852	5,915,383	7,565,608	7,597,841
Two Harbors	3,286,338	9,278,464	6,424,545	8,723,472	9,990,901
Superior	4,991,278	14,812,398	10,919,965	14,068,341	13,978,746
Duluth	9,164,803	15,479,334	16,821,209	20,567,288	20,576,419
Total by lake	22,300,726	58,527,226	47,177,395	61,156,732	62,498,901
Total by rail	498,351	1,884,346	1,369,256	1,679,440	1,938,102
Total	22,799,077	60,411,572	48,546,651	62,836,172	64,437,003

Shipment by Ranges, Gross Tons

	1921	1920	1919	1918	1917
Mesabi	16,350,696	37,149,277	31,997,699	40,396,711	41,445,211
Marquette	1,116,900	4,608,323	2,992,212	4,354,297	4,874,150
Menominee	1,584,404	6,562,106	4,442,868	6,378,698	6,045,750
Gogebic	2,336,493	8,763,332	6,230,839	7,936,701	7,981,684
Vermillion	869,313	1,007,435	929,049	1,192,908	1,530,692
Cuyuna	488,562	1,191,528	1,861,165	2,478,800	2,422,884
Mayville	52,709	129,571	92,819	98,057	136,632
Total	22,799,077	60,411,572	48,546,651	62,836,172	64,437,003

Bessemer Limestone & Cement Co.

Joseph G. Butler, Jr., was re-elected chairman of the board of directors of the Bessemer Limestone & Cement Co., Youngstown, Ohio, at the yearly meeting. John Tod, a director of the Brier Hill Steel Co., Youngstown, was elected president. Directors are Joseph G. Butler, Jr., John Tod, R. C. Steese, Fred R. Kanengeiser, John Stambaugh, Fred Tod, Henry A. Butler, John R. Rowland, I. M. Scott and G. G. Treat.

The company shipped 750,000 bbl. of cement last year and operations indicated that its annual production could be increased to 1,100,000 bbl. annually. Its fluxstone business in 1921 was unsatisfactory, however, due to the low state of blast furnace operations.

The 1922 convention of the American Iron, Steel and Heavy Hardware Association has been fixed for May 23 to 25 at Washington. Arrangements have been made with the Hotel Washington for accommodations. The hotel is at Fourteenth Street and Pennsylvania Avenue, one block from the White House.

Association of Employers and Employees

Unique Institution in Cleveland in Which Better Understanding Is Brought About—Educational and Other Features

A UNIQUE institution is flourishing in Cleveland, of interest to men and managements of the iron and steel industries, because of what it already has accomplished in units of this industry located in the Fifth City, as well as for its potentialities for development in other cities.

"An alliance of employers and employees, with club rooms where men all may get together to study and to discuss problems of mutual interest, to meet on equal terms, to get acquainted with one another and to join for constructive thinking," is the avowed purpose of the organization, which has now been worked out with a sincerity and honesty that are no small factor in the success of the plan.

Primarily an educational institution, because its organizers hold firmly to the belief that only through mutual understanding and constructive thinking by all groups of men in industry will the problems of industry be solved, the Cleveland Industrial Association has worked out its educational features in unusual ways, bringing together employers and employees with a common interest.

For illustration, this winter the association, which by the way has employer and employee members "half and half" on its executive board and committees, has offered its members an unusual business training course. Sixteen of Cleveland's leading business men were prevailed upon to give one lecture each in a course which covered the elements of business building and constituted a comprehensive survey of modern business organization methods. Every lecture is followed by an open forum discussion of points brought out by the lecturer.

Tuesday Night Lectures

Included in the membership fee is a series of Tuesday night lectures when men of national repute bring information worth while alike to employer and employee members of the association.

The keymen of the association—the member-representatives of the organization in the various factories of the city, are co-operating with the Better Business Commission of the Cleveland Advertising Club through the association, to distribute information and literature to protect the small investor from "Fly-by-night" stock salesmen who make their way through the larger plants—illustrating how far-reaching is the conception of the association in the extent of the educational service which it can render its members.

Specialized groups meet to discuss their particular problems; there is the 50-50 Club of salesmen members, the Faneuil Club for those who need to become effective public speakers, and the Efficiency Club, a title which speaks for itself.

Women as well as men are found on the large list of members of the association, which includes several thousands of names from the men in the shops to the president of the Chamber of Commerce.

In addition to the classes, courses, lectures and clubs which are the activities in the club rooms during each week, opportunity for chess, checkers, cards, pool games and magazines, Saturday night dances and daily luncheons with occasional special entertainment features which bring all the members together in a social way in pleasant surroundings, fill a long-felt need.

Illustrative of the way the association's service worked out in the various plants in the city, we quote, for example, the fact that at the Van Dorn Electric Tool Co. and several other plants from which good-sized groups attend the Tuesday lectures, each weekly meeting at the association is followed by a plant meeting where the association lecture is discussed and applied to the work to be done in the industrial unit.

Another striking instance of the result of constructive thinking which fosters no special propaganda has come to the attention of the association's business manager, L. F. Mead. In one plant a rather active radical who became a member of the association and "got the idea" of men working together for the good of all, carried back to his organization ideas about bonus systems which he gathered from various fellow members and in furthering his new idea with the new point of view, became a constructive thinker in his organization.

One employer member became interested in the problem of a foreign worker, a member of the association, whose wife was being held at Ellis Island. Through the greater knowledge of the employer of the conditions governing the situation, the matter was adjusted to the satisfaction of all and the feeling of humanness established between employer and employee, who would not have otherwise gotten on a common footing except through the atmosphere of truce in the club rooms of the association.

According to Herbert Hoover, "a definite and continuous organized relationship must be created between the employer and the employee; by the organization of this relationship, conflict in industry can be greatly mitigated, misunderstandings can be eliminated and that spirit of co-operation can be established that will advance the condition of labor and secure increased productivity."

H. B. Bole, first vice-president Hydraulic Steel Co., and president this year of the Industrial Association, bases the success of the organization in Cleveland on "a sincerity of purpose which makes itself actually felt, added to the fact that the organization is based on the sound principle of mutual understanding."

President Welborn's Address

In a recent address at a meeting of employees' representatives and representatives of the company, President Welborn, Colorado Fuel and Iron Co., reviewed the year 1921, speaking in some detail of the labor troubles in which outsiders persuaded many of the men in the coal mines to strike. Mr. Welborn said in part:

> In all of our negotiations we have found, and it is a pleasure to report the fact, that while opinions differ, as they always do among men on any important matter, we have been able, after open, frank discussion, to reach practically unanimous conclusions. The lower wage scales established at the Steel Works, with the reduced scale at coal mines and the reductions that have been made in freight rates on raw materials, have made possible the resumption in operations at the steel plant on the moderate basis laid out to begin next week.
>
> The officials will continue, as heretofore, to give you the facts about business conditions and the best information possible as to outlook. We will continue to negotiate with you any changes in wages and working conditions, in accordance with the provisions of the joint representation of employees and management under which we are working. We will, therefore, naturally resist in every legitimate way all efforts to prevent the carrying out of agreements entered into between employees and management—such agreements to always be proper and lawful.

Engineering standards issued in 1921 by foreign national standardizing bodies have been compiled by the American Engineering Standards Committee and copies can be furnished at a nominal cost or they may be consulted at the offices of the committee, 29 West Thirty-ninth Street, New York. Included among these standards are 13 British standards, 2 each from Canada, Austria and Belgium, 12 from Holland, 11 from Switzerland, and 62 from Germany.

Steel Corporation Pension Disbursements

A total of $947,879.15 in pensions was paid to retired employees of the United States Steel Corporation and its subsidiary companies during 1921, according to the eleventh annual report of the United States Steel and Carnegie Pension Fund just made public. This is $168,112.55 more than was disbursed in 1920, and is the largest amount paid out in any year since the establishment of the fund in 1911. There were 3677 participants, 2969 being on the list at the beginning of 1921 while 708 were added during the year. There were 240 discontinuances because of death or other causes, leaving 3437 active participants as of Jan. 1, 1922.

The total amount disbursed since the establishment of the fund is $6,828,460.75. The average age of the pension participants for the past 10 years has been 66.10 years, the average term of service 30.95 years and the average monthly pension $24.10. The beneficiaries make no contribution to the fund. The money is derived from a trust fund of $12,000,000 established by Andrew Carnegie and the Steel Corporation.

Retired employees of the Carnegie Steel Co. in 1921 received $204,470.70; those of the American Steel & Wire Co., $185,201.45; of the American Sheet & Tin Plate Co., $125,404.20; of the National Tube Co., $106,205.47; of the H. C. Frick Coke Co., $80,485.99, and of the American Bridge Co., $75,194.33.

Men retired from general office staffs, including the Steel Corporation general office in New York, received $17,962.85, and former employees of sales departments were paid $7,469.

Lead and Zinc in 1921

The mine and smelter output of lead in the United States in 1921 each fell off about 20 per cent and the mine and smelter output of zinc each declined nearly 60 per cent, according to C. E. Siebenthal and A. Stoll, of the U. S. Geological Survey, compiled from reports and estimates by producers and others. Data for the Western States are taken from the advance statements issued by the Geological Survey's western offices. Statistics of imports and exports are taken from the records of the Bureau of Foreign and Domestic Commerce for 11 months, and an estimate is made for December.

The output of soft lead by mines of the Mississippi Valley was about 231,000 short tons, and that of argentiferous lead by mines of the Western States was about 170,000 tons, a total of 401,000 tons. The corresponding figures for 1920 are 251,816 tons from the Mississippi Valley (including the small output of the Eastern States) and 259,070 tons from the Western States, a total of 512,865 tons. The recoverable zinc content of ore mined in 1921 was about 250,000 tons, as compared with 584,772 tons in 1920 and 549,242 tons in 1919.

The output of primary domestic desilverized lead in 1921 was about 190,000 net tons, of soft lead about 145,000 tons, and of desilverized soft lead about 55,000 tons, making a total output from domestic ores of about 390,000 tons of refined lead, as compared with 476,849 tons in 1920, which was made up of 220,327 tons of desilverized lead, 189,854 tons of soft lead, and 66,668 tons of desilverized soft lead. The output of lead smelted and refined from foreign ore and bullion was about 50,000 tons, as compared with 52,808 tons in 1920. The total lead smelted and refined in the United States was thus about 440,000 tons, as compared with 529,657 tons in 1920. The output of antimonial lead was about 8,000 tons, as against 12,535 tons in 1920.

The output of primary metallic zinc from domestic ores in 1921 was about 194,000 tons and from foreign ores about 2,500 tons, a total of 196,500 tons, as compared with 450,045 tons from domestic ores and 13,332 tons from foreign ores, a total of 463,377 tons in 1920. In addition to primary zinc there was an output of about 17,000 tons of redistilled secondary zinc, as compared with 21,371 tons in 1920, making a total supply of distilled zinc and electrolytic zinc in 1921 of 213,500 tons, of which 31,500 tons was high grade and intermediate, 32,000 tons select and brass special, and 150,000 tons prime western. The output of the corresponding grades in 1920 was 114,606, 59,811, and 310,331 tons, respectively, a total of 484,748 tons.

The exports of zinc made from foreign ores were about 1260 tons and those of zinc made from domestic ores were about 3200 tons, as compared with exports of 28,368 and 85,898 tons, respectively, in 1920.

The two largest zinc rolling mills have added zinc shingle machinery to their equipment. This use of sheet zinc is one of the most promising now being developed.

Kentucky Troops Again Sent to Newport

Governor Morrow of Kentucky has ordered 350 National Guardsmen to Newport, Ky., where a strike is in progress at the plant of the Newport Rolling Mill Co. The troops had been stationed in Newport for five weeks, but were withdrawn on Jan. 28 on receipt of intimations that the civic authorities were able to handle the situation. Since the troops were taken away, a reign of terror has existed and on Wednesday night it is estimated that 3000 shots were fired in the vicinity of the mill. The situation became so tense that a tank company from Covington, Ky., was called out at midnight to maintain order. In connection with this strike Governor Morrow issued two statements, one to the press and another proclamation addressed to the people of Newport. These statements are interesting as showing conditions existing in that city at the present time and also as to what conditions officials of the rolling mill company are forced to contend with in trying to operate their plant. As a result of the lawlessness which has existed in Newport for some time, several large manufacturing plants have about decided to remove their plants from that city across the river to Ohio.

Governor Morrow's proclamation upon sending troops to Newport is as follows:

To the People of Newport:

Law, order and security do not exist in Newport. For the past week a reign of terror has existed. Men have been shot down in the open streets. Citizens have been assaulted and beaten. Women have been abused and insulted. Men have been threatened and intimidated. Homes have been fired into and the torch has been applied. Lawlessness—brazen, open and defiant—has been supreme. Your peace officers advise me they are powerless.

I am sending the National Guard troops of the commonwealth of Kentucky to put an end to this condition. Any one who fires upon, strikes or insults a State trooper fires upon, strikes and insults Kentucky, and will be treated accordingly.

The manhood and conscience of Newport must assert itself. I call upon every power of the city which stands for supremacy of law to co-operate with the troops. I call upon every law-abiding citizen of Newport to stand up and be counted for the law of the land. Violence and terror have existed. They must cease to exist. Lives have been threatened and endangered. They must be made safe and secure. Newport has been disgraced and dishonored. The cause of this disgrace and dishonor must cease.

EDWIN P. MORROW,
Governor of the Commonwealth of Kentucky.

Feb. 2, 1922.

Great Bridge Proposed

The Mackinac Development Co. has been organized to investigate the feasibility of building a bridge across the Straits of Mackinac, or a tunnel under the straits. Engineers believe that the most feasible route for a bridge would be between Cheboygan, Mich., and St. Ignace, Mich., utilizing several islands in the straits. Charles Evan Fowler, consulting engineer of New York, has been retained to do the investigation work. The board of advisors on the project includes Prof. H. E. Riggs, University of Michigan; Prof. M. E. Cooley, dean of engineers, University of Michigan; George H. Pegram, chief engineer of the Interborough Rapid Transit Co. and Prof. William H. Burr, consulting engineer of New York.

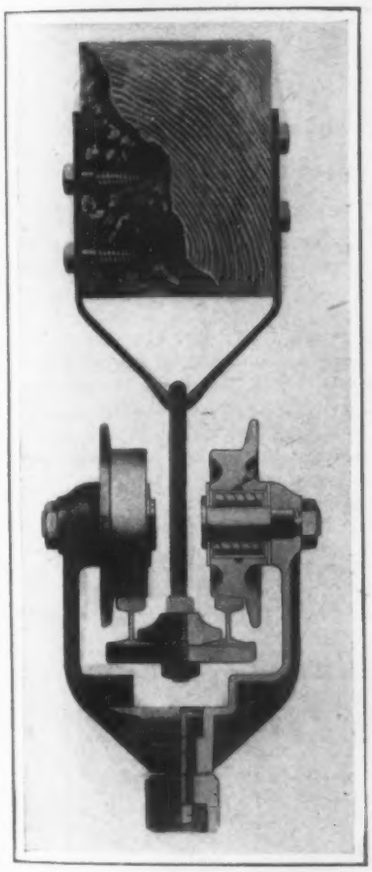
The Wheeling Steel Corporation this week will ship down the Ohio River to Memphis, Tenn., two barge loads of steel pipe, the shipment aggregating 1700 tons.

Double-Rail Overhead Conveying System

Safeguards Against Track-Jumping—Trolleys Have Two, Four or Eight Wheels—Can Carry Load of 3000 Lb.

BY G. L. LACHER

THE Dreis & Krump Mfg. Co., 2909-23 South Halsted Street, Chicago, has put on the market the "Atlas Carryall" overhead conveying system, designed to meet the demand for simple, safe, reliable and relatively inexpensive equipment for moving material in plants where the usual load does not exceed 3000 lb.



Double Rail Construction Was Adopted for This Overhead Conveying System Because That Design Was Regarded as the Best Insurance Against Trolley Jumping. The rails are supported by a plate suspended by U-bolt from overhead brackets and are held in place by a cast-iron wedge through which the U-bolt passes. That side of the base of the rail under the wedge is wider than the outer side; hence the center of gravity of each rail is thrown inside of the web, thereby minimizing the possibility of the rails becoming dislodged and turning outward

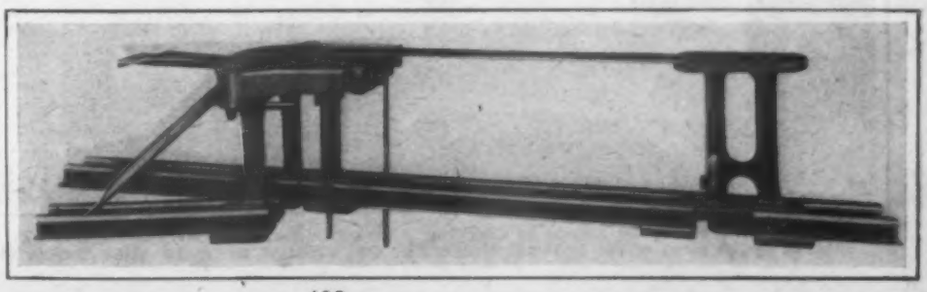
The construction is such as to make it unnecessary in many plants to erect a superstructure from which to suspend the system. In buildings in which wooden joists project from the ceiling, supporting brackets may be fastened directly to the joists. Brackets suitable for fastening to steel roof trusses have also been provided, while for reinforced concrete ceilings special inserts have been devised.

Hanging from the brackets are U-bolts which support a track on which the material handling trolleys operate. Both legs of the U-bolt are threaded so that the position of the track is adjustable within a fraction of an inch. The track consists of two parallel rails, double rail construction having been adopted in preference to the usual monorail type to minimize the possibility of the trolley jumping the track. The rails are laid on a plate to which the U-bolt hangers are bolted, the supporting nuts being on the bottom of the plate. Thus the rails are supported from the bottom instead

An Eight-Wheel Trolley Is Made Up of Two Four-Wheel or Four Two-Wheel Trolleys. A four-wheel trolley is made up of two sets of two-wheel trolleys, joined together by a connecting bar, and two four-wheel trolleys similarly connected form an eight-wheel trolley. The latter will handle a load up to 3000 lb.

of the top, this design having been selected to eliminate the danger of the rails becoming dislodged and dropping to the floor. To further insure the stability of the track, the company uses a special rail section, the base of which is wider on one side than on the other. When the rails are placed on the supporting plate the wider bases face each other and upon them is superimposed a wedge through which the legs of the U-bolt pass. The wedge holds the wide bases of the rails in place. By throwing the center of gravity of each rail toward the middle of the track, the possibility of the rails being forced out of position and turning outward is reduced.

Throughout the design of the Atlas Carryall system principles of safety and stability were given heed. Thus the clearance between the track supporting plate and the trolley frame was made as small as possible as an additional safeguard against trolley jumping. In other words, in such a rare case where the trolley might jump, the frame would strike the supporting track



Switches Are of the Movable Tongue Type. Separate right and left-hand two-way switches are unnecessary with this system, the one switch, shown in the illustration, suffices for both types of turns

plate before the trolley wheels could leave the rails. Any tendency of one wheel to leave the rail upon which it operates is overcome by the contact of the flange of the opposite wheel against the head of the other rail.

The trolley wheels are of cast iron, which material is strong in compression. The wheels rotate on Hyatt roller bearings, all turned and bored to limits of plus or minus 0.002 in. The bearings are spiral and alternately left-hand and right-hand, throwing oil in opposite directions and drawing dirt and dust into their hollow centers, thereby leaving the surface smooth. The bearings are incased in a hardened steel sleeve pressed into the bore of the wheel, with dust-proof washers at each end, outside of which are thrust washers. The bearings revolve around a hardened steel pin with a Brinell test of 200 to 225.

The trolley frame is made entirely of steel castings, and all surfaces in contact are machined. The smallest trolley made has two wheels. A four-wheel trolley is made up of two sets of two-wheel trolleys, joined together by a connecting bar which is supported by pins having unusually large bearing surfaces. The four-wheel trolley will handle a load up to 1500 lb. The eight-wheel trolley, which consists of two four-wheel trolleys joined together, takes a burden up to 3000 lb. The pins and the hooks are drop-forged. Bumpers are integral with each pair of trolley wheels, so that two or more trolleys can be pushed along together without the wheels bumping each other.

Switches are of the movable tongue type, instead of the sliding type. The hinged end of the movable tongue is of such construction that there are no ill-fitting joints for the trolley wheels to jump over. Although a connecting pin has been inserted at the hinge as a safety precaution, the tongue actually rotates in a semi-circular lapped joint, so that practically a continuous and uninterrupted surface is provided for the trolley wheels to pass over at the junction of the track and the tongue. The switches are so guarded that a trolley cannot run off the end of the track, either when it is open or when the tongue is being moved from one position to another. Except when the switch is exactly connected, a guard, which rests on the track, bars the progress of the trolley. Both two-way and three-way switches are supplied. Separate right- and left-hand two-way switches are unnecessary with this system, the one switch sufficing for both types of turns.

It is claimed that the Atlas carry-all system may be installed by any mechanic. The rails, which are 2½-lb. sections made from new billet stock, may be bent at the place of installation to suit the requirements of the job. For this purpose the Dreis & Krump Mfg. Co. has supplied a special bending iron. This is a steel casting, which may be fastened to a column and in which the rails may be bent by hand to any degree of curvature desired. In fact, rails have been bent down to a 10-in. radius without interfering with the operation of the trolleys thereon.

Special Bending Irons Have Been Provided So That the Rails May Be Bent at the Place of Installation to Any Degree of Curvature Desired

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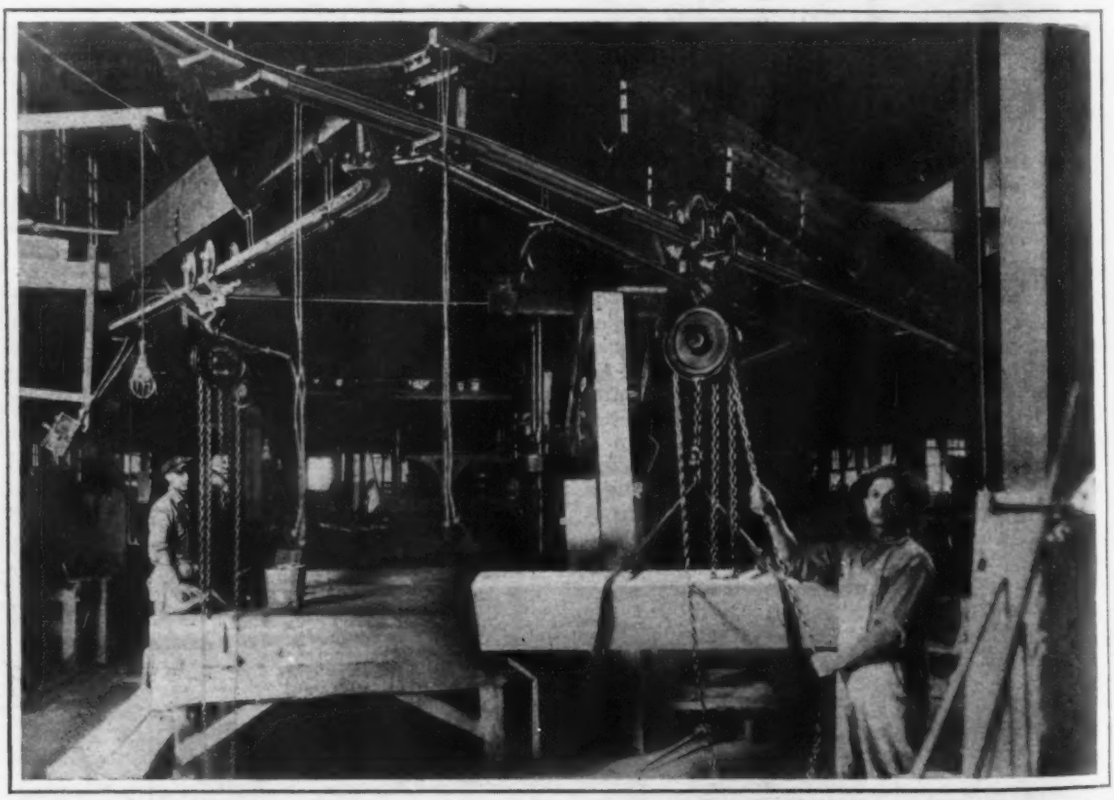
The American Society of Mechanical Engineers, the American Institute of Mining and Metallurgical Engineers, American Institute of Electrical Engineers, American Society of Civil Engineers, Illuminating Engineering Society, New England Water Works Association, and the American Society of Heating and Ventilating Engineers were well represented at the thirteenth annual engineers' dinner held Tuesday evening, Feb. 7, at the City Club, Boston. President Lowell, Harvard University, spoke on the Armament Conference in Washington, and Philip Cabot on the engineer's opportunity.



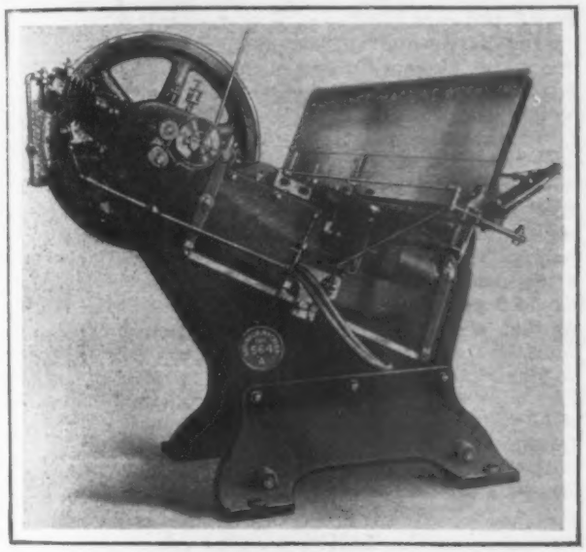
The Four-Wheel Trolley Shown Is Carrying a Concrete Stair Tread Weighing 1200 Lb. The photograph was taken in the plant of the National Mosaic Tile Co., Chicago, where an Atlas system has been installed

New Automatic Stagger-Feed Press

An automatic stagger-feed press for the economical production of jar closures, can tops and bottoms, small shells and similar work has been developed recently by the Adriance Machine Works, Inc., 80 Richards Street, Brooklyn, N. Y.

The staggered arrangement affords a saving in metal, blanks being punched with but a thread of metal between them. The simplicity of construction is a feature, the press having fewer parts than the usual design. It is claimed that over 100 blanks a minute from 1 to 4 in. in diameter can be accurately punched out, the quantity decreasing or increasing according to the size of the work.

The press, which is designated the No. 564 A, is shown in the accompanying illustration. An outstanding feature is the continuous action of the punch while the sheet carrier travels in either direction. It is not necessary for the carrier to return to the starting point after punching a row, for the moment the end of a row is reached the action is reversed automatically and the next row punched out as the carrier returns to the starting point.



Automatic Stagger-Feed Press for Production of Jar Closures, Can Tops and Bottoms and Similar Work

When the last blank is punched from the sheet the carrier is automatically stopped and stands ready to receive another sheet. This arrangement is said to enable the operator to run several presses and to turn out over 100,000 blanks per day. There is only one die. Scrap is ejected automatically and cut into skeleton frames. The design provides for the safety of the operator, as at no time are his fingers near the die while the press is running.

To Investigate Waste in Industry Report

The report on elimination of waste in industry made under the direction of the Federated American Engineering Societies is now under study by members of the National Industrial Conference Board. The members have been urged to consider the report in detail in order that they may corroborate and further emphasize statements in the report or conclusively prove the fallacy of statements of the report. It appears that some of the members of the National Industrial Conference Board are of the opinion that parts of the report reflect the truth but that others are contrary to fact, and while the true ones should be strongly supported, the incorrect statements should be refuted. As the analyses are received, it is the plan of the board to prepare a statement for general publication. The investigating movement is a commentary on the interest developed in the report, and also a commentary on the authority which the report is believed to possess through the fact that the committee was appointed by Herbert Hoover, while president of the federation.

THREE COMPANY MERGER

Negotiations of Steel Companies in Trying to Get Together Still Pending

CHICAGO, Feb. 7.—Notwithstanding reports to the contrary, negotiations are still under way toward the three-company consolidation of independent steel mills. Conferences of the interested parties were held in Chicago and New York last week and another meeting will take place in New York Feb. 13.

As yet the three companies have not come to an agreement on the valuation of their properties. Another difficulty lies in the fact that one of the parties to the negotiations has exceptionally heavy raw material holdings which are largely covered by bonds, the interest on which is rather a heavy burden under present conditions. It is intimated, however, that progress is being made toward a solution of these problems.

Youngstown Company May Build at Chicago

YOUNGSTOWN, Feb. 7.—In case the proposed independent steel merger involving the Youngstown Sheet & Tube Co., Inland Steel Co. and the Steel & Tube Co. of America, the latter two interests of Chicago, fails to materialize, it is understood the local interest will establish a Chicago district pipe connection. In fact, construction of a tube mill plant in the West has been considered by the Sheet & Tube company for some time, and it is reported in some quarters that land for a new plant has already been optioned.

That the proposed consolidation has struck a snag in the demands of Inland Steel, which may prove insurmountable, is current comment. Consequently the possibility of developments, should the combine fall through, is being extensively discussed.

It is currently reported that not only has Inland Steel failed to adequately mark down its holdings to meet the idea of the other companies, but is demanding a substantial sum for its position in the Chicago district.

On the other hand, it is felt that difficulties encountered in connection with the high bonded indebtedness of the Steel & Tube Co. and its appraised value may be reconciled.

On account of the attitude of the Inland Steel Co. there was considerably less optimism in well informed circles in Youngstown this week as to the ultimate success of the plan.

In fact, there were hints in some quarters that the inability of the conferees to come to an agreement might be openly recognized and admitted within a short time. Efforts might still be put forth, it is explained, toward effecting an amalgamation even though such admission were made.

It is claimed that the investigations and compilations have developed the fact that the Sheet & Tube company is on a low cost basis with respect to pipe production as compared with Chicago district makers. On the other hand, the latter enjoy an advantage in freight rates on shipments to the West and Southwest, through their location.

The possibilities of a merger with the Jones & Laughlin Steel Co., Pittsburgh, which is to establish a Western plant, have been thoroughly canvassed, it is understood, but the latter interest has refused to entertain any consolidation proposal.

Miners' Time Lost Through Strikes

WASHINGTON, Feb. 7.—Supplementing the statistics of man-days lost on account of strikes, the United States Geological Survey this week presents data as to the man-days lost through other causes. In the 20-year period, 1900-1919, the operators reported a total loss of 124,747,199 man-days through strikes, but the loss attributable to other causes was 1,053,576,000 man-days, or eight and a half times as great as the strike loss. To put it another way, in two decades American coal miners lost 10.5 per cent ascribable to strikes and 89.5 per cent to other causes, chief of which are no market, coal shortage, and mine disability.

New Line of Pneumatic Riveters

A line of pneumatic riveters of the type shown in the accompanying illustration and in various capacities from 10 to 150 tons has been placed on the market by the Southwark Foundry & Machine Co., Philadelphia.

The machine is of the compression yoke type using a toggle action to give movement to the die, which advances rapidly to the rivet, decreasing in speed and increasing in pressure as it travels. The die travels a sufficient distance at practically uniform speed and rated pressure to assure satisfactorily driving tight rivets, drawing the plates together and following up

The Die Is Set for a Run of Work So That the Rivet Is Headed When Piston Has Made Three-Quarters of the Stroke

the shrink of the rivet with full pressure until it takes its set. It is not necessary to drive the rivet at the end of the die travel or piston stroke. The die is set for a run of work so that the rivet is headed when the piston has moved through ¾ of the stroke, thus allowing sufficient die travel at full pressure on either side of this position to take care of variations in length of rivets, thickness of plates, dimensions of holes, etc. This obviates the necessity of further adjustment of the die screw.

The operating valve is of the plain slide type, requiring but one simple wick packing on the stem end and having a removable valve seat for ready regrinding. It is further provided with means for using line pressure in the pull back. Two separate pressures on the rivet die can be obtained by turning a plug cock in the valve plate, admitting air at full pressure in the pull back area. This reduces the pressure to the next lower tonnage rating, that is, a standard 50-ton machine is arranged to develop both 50 and 30 tons on the die. Special equipment such as pressure regulating valves, auxiliary storage tanks, etc., are eliminated in this design.

The riveter frames are steel castings of I-beam section. All portable machines are provided with suspension, and above 36-in. reach, with feet for stationary position. The reach of the smallest machine is 4 in. and the gap 10 in., the same dimensions for the largest machine being 21 ft. 6 in. and 18 and 24 in. gap. The cylinder diameters are 7¼ to 20¾ in.

High Carbon in Weldless Steel Tubing

An account of experiments conducted with high and low carbon steels was presented at a joint meeting of the Institution of Automobile Engineers and the Birmingham Metallurgical Society, Birmingham, England, by W. W. Hackett.

Experiments on aeroplane tubing during the war showed that excellent results could be obtained by using 0.5 per cent carbon steel tubing giving in the bright or blue state a yield of 40 to 45 tons per sq. in., and an ultimate stress of 45 to 50 tons per sq. in. In the motor trade there was a disinclination to use these high carbon steel tubes, which it was thought would necessarily be brittle. No extra care had been used in heat treatment, but the result of hundreds of tests carried out showed that 0.3 per cent carbon was always better than 0.15 per cent, and 0.5 invariably superior to 0.3 per cent.

Details were given of a number of these tests. In one series 20-gage tubing made of 0.54 per cent carbon steel had practically as long a life under the same weight and shocks as 17-gage tubing manufactured of 0.338 per cent carbon steel. Figures were given showing the greater strength of high carbon than of medium and low carbon steels. One experiment showed that a 20-gage high carbon steel was practically as strong as a 15-gage low carbon steel, though only half as thick. This was attributed to the fact that after undergoing the brazing process the elastic limit of a 0.5 per cent carbon steel was about twice as high as that of a 0.15 per cent carbon steel at the brazed joint, and consequently the high carbon steel was able to stand much more stress than the low carbon. It was also concluded that the high carbon quality had twice the life of a low carbon when subjected to the same fatigue.

In a discussion which followed, A. E. Tucker called attention to the fact that silicon had a great effect upon the mechanical properties because of its influence on carbon, and it should always be taken into account in connection with the carbon content.

Explosion at a Frick Mine

UNIONTOWN, PA., Feb. 6.—Investigations into the fatal disaster at the Gates plant of the H. C. Frick Coke Co. in which 25 men were killed got under way to-day with the arrival of Seward E. Button, head of the State Department of Mines. Coroner S. H. Baum held a preliminary conference with Frick and State officials to-day and will meet with them again on Monday. Cause of the blast has not been determined.

Damage to the Gates mine was comparatively small, the disaster being confined to one section, known as the Ross section. The disaster was the first serious Frick accident since 1891 when approximately 100 men lost their lives in an explosion at the Mammoth plant.

Shipping Steel by River

PITTSBURGH, Feb. 6.—Preparations are being made by the Jones & Laughlin Steel Co. to make up and send down the rivers early in March one of the largest tows of steel products ever shipped by water. It is anticipated it will exceed any previous barge movement by several thousand tons. Up to the present, this company has delivered more than 500 freight carloads of its products in its steel barges to consumers in the Ohio and Mississippi Valleys. Delivery by barge is said to be a couple of dollars a ton cheaper on the average than delivery by rail.

Ford Blast Furnace Breaks Its Record

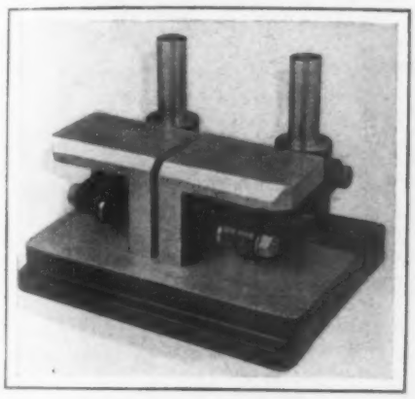
All previous records for production and for coke consumed per ton of iron of the Ford Motor Co.'s A furnace were broken in January. The record was as follows: 18,278 tons of pig iron. Average per day 604 tons. 1791 lb. of coke per ton of pig iron. Of this iron 1157 tons was foundry iron averaging 3.50 per cent silicon. The rest was malleable iron, the silicon ranging from 1.00 to 1.87 per cent. The best day's run was 701 tons.

Universal Drill Fixture

A universal drill fixture intended to save time by providing a quick and accurate means of holding parts of any shape for drilling, is being offered by the Hartmann Mfg. Co., Hartford. It is primarily for use in tool rooms and in shops doing job work.

As shown in the illustration, the fixture consists of a base ground for a layout table, with two angle irons swinging on horizontal arms which can be raised or lowered. The angle irons are ground on one side to 45 deg., making a V-block with its mate, the other side having a groove to hold the work in place. The angle irons are interchangable in any position.

The entire fixture is 10 by 12 in. with a working



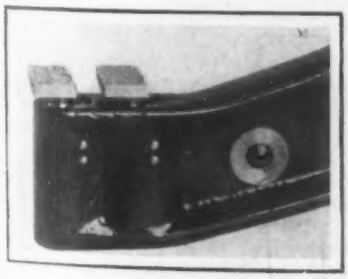
The Fixture Is Strapped to a Drill Press Table. It is intended to save time on work requiring use of parallels, angle irons or V-blocks

height of 8 in. from the face of the table. The surface of the base is ground for a layout table 5½ by 12 in. The construction is rigid, the fixture being designed so that a ⅝-in. drill will produce a plus or minus deflection of not more than 0.002 when the drill is on the extreme edge of the angle iron at the extreme height. The angle iron can be locked solidly in any position on the studs, which are of steel, hardened and ground.

The device is said to do everything that can be done with parallels up to 8-in. in height, V-blocks up to 9 in., or angle irons of this size, and variety of work in addition. Thin flat stock can be held and drilled in the grooves of the angle irons. Triangular and V-shaped pieces are held easily and accurately in place, and round tapered parts are said to give no trouble. Work requiring blocking can be placed on one angle iron and the other angle iron adjusted to the right height and locked in a few seconds.

Square Anvils for Trus-Form Gages

Trus-Form gages offered by the Pratt & Whitney Co., Hartford, and described in THE IRON AGE, June 30, 1921, may now be obtained with large square-head anvils as shown in the illustration. The adjustment



Square Anvils Permit Working to a Shoulder. This type is interchangeable with round-head type

and locking device is the same as that previously described, two opposed headless set screws working in the frame pulling against each other. Square anvils permit working up to a shoulder and give a larger wearing surface. This type of anvil is interchangeable with the round-head type and new anvils may be substituted at any time.

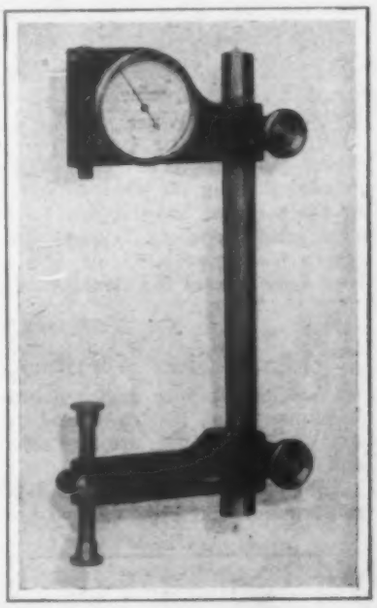
The Favorite Stove & Range Co., Piqua, Ohio, has resumed operations in its foundry which has been closed down since late in December.

Extension-Beam Indicating Caliper

The indicating caliper shown in the illustration, has been placed on the market recently by the H. W. Horstmann Co., Irvington, N. J. It is designated as the No. 20 and is intended for work beyond the capacity of the company's regular instrument. It is adaptable for use on the planer for duplicating widths on flat work and on the lathe for chuck work, especially in gaging across large diameters. It shows visually either the amount of stock still to be removed or how much the work is undersize at any stage of its making.

The caliper is set by placing a sample of the desired length between the plunger and the adjusting screw. The latter is then advanced until the indicator registers zero, and then locked. The dial is graduated to show the movement of the plunger in thousandths of an inch and variation in the lengths of pieces placed between the plunger and the adjusting screw is shown by the distance the indicator moves from zero.

The rear surface of each arm is finished flat. To bring the plunger and the adjusting screw in alignment it is only necessary to lay the instrument face upward on a flat surface. Tightening the clamping screws rigidly locks the arms on the beam. The beam is regularly 6 in. long and of ½ in. round cold rolled steel, a size of stock usually found in any shop and therefore any length of beam can be conveniently made up. By reversing the position of the arms on



Wear Will Not Affect Accuracy, as Zero, the Only Important Point on the Dial, Is Always Fixed by Adjustment

the beam, the instrument becomes an inside indicating caliper for large diameters, the minimum diameter that can be measured under these conditions being 4¾ in.

Jones & Laughlin Steel Co. Plans

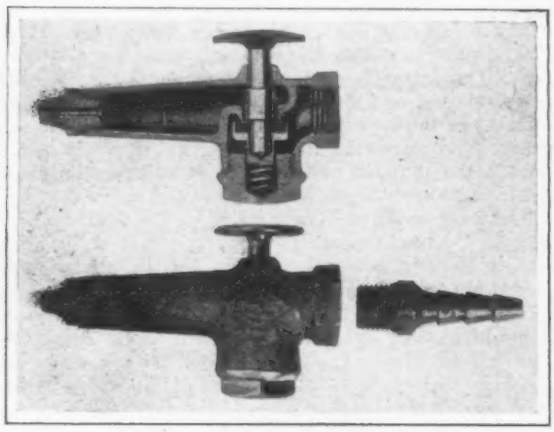
The second step in the development of the Jones & Laughlin Steel Co. project at Hammond, Ind., was taken when articles of incorporation were filed by the Adelaide Land Co., which was organized to purchase the 900-acre site for the plant to be constructed by the steel company. The incorporators of the land company are members of the organization of the Fletcher Savings & Trust Co., Indianapolis, which represented the Jones & Laughlin Steel Co. in the negotiations for the land. Transfer of the land to be bought by the land company to the steel company will be made shortly, it is said.

Hausman & Wimmer Co., First National Bank Building, Pittsburgh, has purchased the old South Street bridge, Philadelphia, which is being razed to make way for a new structure. There are about 1000 tons of wrought iron in the old bridge, which the buyers will scrap.

Air Gun for General Dusting

The accompanying illustration shows an air gun recently placed on the market by Jenkins Bros., 80 White St., New York.

The features emphasized are that it holds tight under pressure, when closed, thereby eliminating leakage and consequent air waste; and that it quickly responds to the press of the button, freely emitting the air. A renewable disk of special design is intended to form perfect contact on the seat and take up the



Air Gun for Foundry and Machine-Shop Use

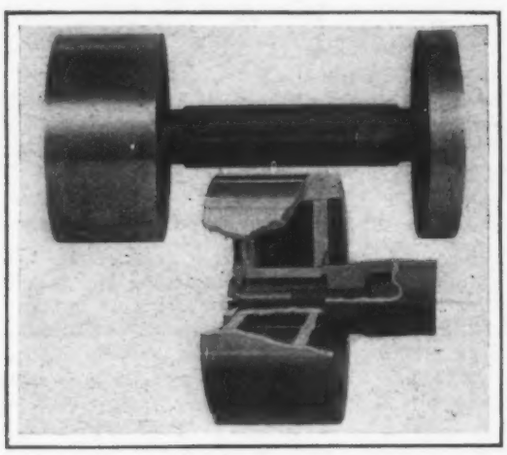
wear caused by hard usage. Each valve is cast of steam bronze. By the use of different hose nipples the gun is adaptable to ⅛, ¼, ⅜ and ½ in. hose pipe.

In foundries the gun can be used in blowing off cores, cleaning core boxes, flasks, patterns and for general dusting, in place of hand bellows or brushes. In the machine shop it can be used for blowing out chips, cleaning tools, benches, etc. It can be used in forges for tempering tools, and in many other places where air is used for cleaning or drying purposes.

Large Sizes of Trilock Plug Gages

The Trilock plug gages manufactured by the Pratt & Whitney Co., Hartford, and described in THE IRON AGE of Sept. 1, 1921, are now offered in sizes of 2½ in. and larger diameter.

The large gages are made hollow for lightness, the construction being shown in the accompanying illustra-



The Go Plug Is Lightened by Web and Flange Construction

tions. The hollow construction applies to the "go" plug being lightened by a web-and-flange construction. The two disks shown are forced into the ring on a taper before grinding and grip the central tube, holding the parts securely. The reversible feature is intended to provide double the usual wearing surface. Three prongs on the handle are forced into three grooves in the bushing, providing a three point self centering tripod support without rock or shake. The washer at one end and the handle at the other bear on both the stay-tube and the disks, binding the assembled gagehead to the handle.

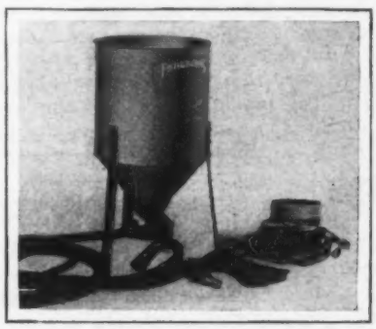
Reversible and renewable-end Trilock gages can now be had single and double end, threaded in all sizes above ½ in., and plain cylindrical in all sizes 5/16 in. and above.

Small Hose Sand Blast

A small hose machine sand blast, a recent addition to the line of the Pangborn Corporation, Hagerstown, Md., is shown in the accompanying illustration. Although small enough to be picked up and carried, it is said to be a practical design and to do the work of any sand blast.

The hose machine consists of a suction-type gun with the blast action controlled by a trigger in the handle. Compressed air passing through the air jet creates a vacuum by which the sand or metallic abrasive is brought from the hopper to the gun body. The gun body forms a mixing chamber for the air and abrasive, which is given a swirling action, similar to that produced by the rifling of a gun barrel. This design, it is claimed, produces a most effective blast stream.

It operates at pressures from 5 to 100 lb. Interchangeable nozzles are provided, adapting the apparatus to plants having a small volume of compressed air or a small amount of work. There is a small cabinet which sets over the hopper. This provides an



The Gun Is of Suction Type with Blast Action Controlled by Trigger in the Handle. A small cabinet sets over the hopper

economical means of cleaning small parts, furnishing a complete, self-contained, continuous cabinet sand blast.

Demand from Poland for Machine Tools

WASHINGTON, Feb. 7.—Increased demand for machine tools, railroad equipment, etc., in Poland is likely, says Trade Commissioner Smith, in consequence of the acquisition of territory in Upper Silesia, where there are large industrial establishments which formerly received their supplies chiefly from Germany. The report says the Germans are likely to be strong competitors with the United States for supplying machinery and equipment. Hitherto the German Government has actively discouraged the export of German goods to Poland, but under the decision of the League of Nations dividing Upper Silesia, Germany is required to permit free exportation into that part of Silesia which has been assigned to Poland and in any case German commercial and industrial interests are putting pressure on the Government to relax any restrictions against sales into Poland and the German Government as a result is said to have issued instructions that no obstacles should be placed in the way of export to Poland of machinery, construction materials and locomotives. The report says American manufacturers would do well to take prompt measures for securing trade in these classes of goods in Poland and that in particular there might be immediate prospect for the sale of railroad cars to the Polish State railroads.

The Donner Furnace of the Donner Steel Co., Buffalo, banked several weeks ago, started Feb. 1. The stack now in blast was blown out after a minor accident.

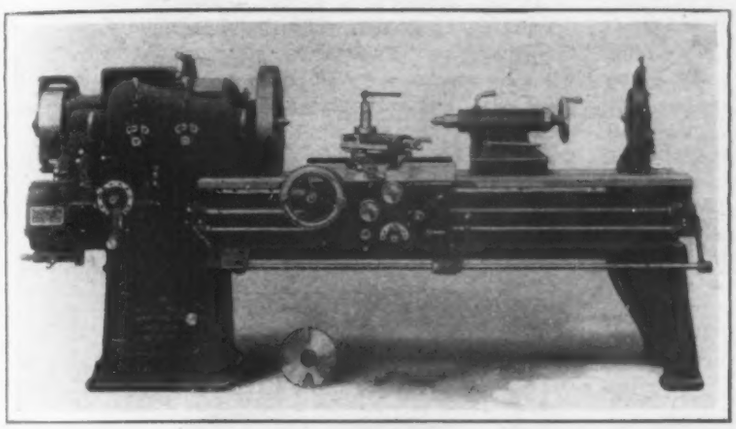
New 18-In. Coneless Engine Lathe

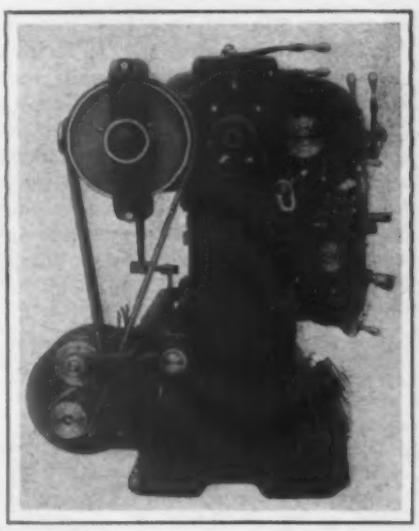
The accompanying illustrations show the new 18-in. coneless engine lathe which is being placed on the market by the Boye & Emmes Machine Tool Co., Cincinnati.

The separate view of the headstock with cover removed shows the arrangement of shafts, clutches, gears and levers for speed changing. All levers are either drop forgings or steel castings and the main spindle bearings can be adjusted, without removing the top cover. The top cover is provided with a removable plug for filling the headstock with oil, and a glass oil tube

The mounting of the motor is shown in the end view illustration. The cabinet leg has two planing strips, the top strip having a slot planed the entire length and being jig drilled and tapped. The motor-base plate is jig drilled to match the cabinet leg, the plate carrying an idler pulley running on S K F ball bearings, to provide proper belt tension. Any standard make of constant speed motor can be used, the size recommended being from 3 to 5 hp.

The swing over the bed is 19⅛ in., over the carriage 13¼ in., over the compound rest 11⅝ in., and over the taper attachment 10¾ in. The front journal is 3¼ in.



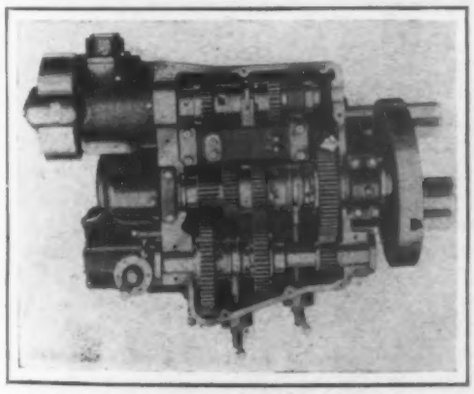


Coneless Engine Lathe. Twelve main spindle speeds are provided, which are selective. End view to right shows mounting of the motor

on the headstock shows the level of the oil, which should be normally about half full.

The main spindle is a chrome-nickel steel hammered forging, heat-treated. All spindles have large collars forged integral with them, affording a large diameter for seating face and chuck plates. All shafts in the headstock, back-gear shafts, initial driving shaft and intermediate shaft are of alloy steel, heat-treated and the keys or feathers required are milled integral with the shaft. All bearings, including the main spindle bearings, are of phosphor bronze.

Twelve main spindle speeds are provided, and are selective. Thirteen gears are used. Clutches and



Headstock with Cover Removed Showing Arrangement of Shafts, Clutches, Gears and Levers for Speed Changing

clutch gears are hardened and oil tempered and gears always in mesh run in a bath of oil. Positive clutches are provided for speed changing, which is effected instantly and without an interference device. Conflicting gear ratios cannot be engaged. The driving pulley is 18 in. x 4 in., for a 3-½ in. double belt and is designed to run at 350 r.p.m. giving spindle speeds of 350 r.p.m. to 9 r.p.m., maximum and minimum. The lever for starting, stopping and reversing the lathe spindle is located at the right-hand end of the apron an auxiliary lever for this purpose being located on the headstock.

in diameter, 5⅛ in. long; and the rear journal 2¼ by 3⅞₁₆ in. The spindle nose is 3 in. in diameter and has 6 threads per in. The hole in the spindle is 1½ in. The tailstock spindle is 2⅝₁₆ in. in diameter and has a travel of 9 in.

The lathe cuts 2 to 56 threads per in. and the feeds per in. are ⅛ to 224. The lead screw threads are four per in. and the distance between centers on a coneless lathe with 8 ft. bed is 4 ft. 2 in. The floor space occupied is 10 ft. by 3 ft., and 10 ft. by 3 ft. 7 in. for the motor driven lathe. The weight of coneless lathe with 8 ft. bed is 4269 lb.

Will Rehabilitate Seaboard Equipment

The Seaboard Bay Line Co. has been organized by the Seaboard Air Line Railway Co. and the Baltimore Steam Packet Co., to purchase, rebuild, or otherwise provide for the reconstruction of their cars and equipment. The company will have $1,500,000 capital to pay in. S. Davies Warfield, president of the Seaboard Air Line, said that 5000 freight cars, or over 30 per cent of the road's rolling stock, were returned from Federal control unfit for service, with the result that the road's actual payment of daily charges for the use of the cars of other roads rose to $1,500,000. He said that the company's locomotives when returned needed repairs costing $500,000.

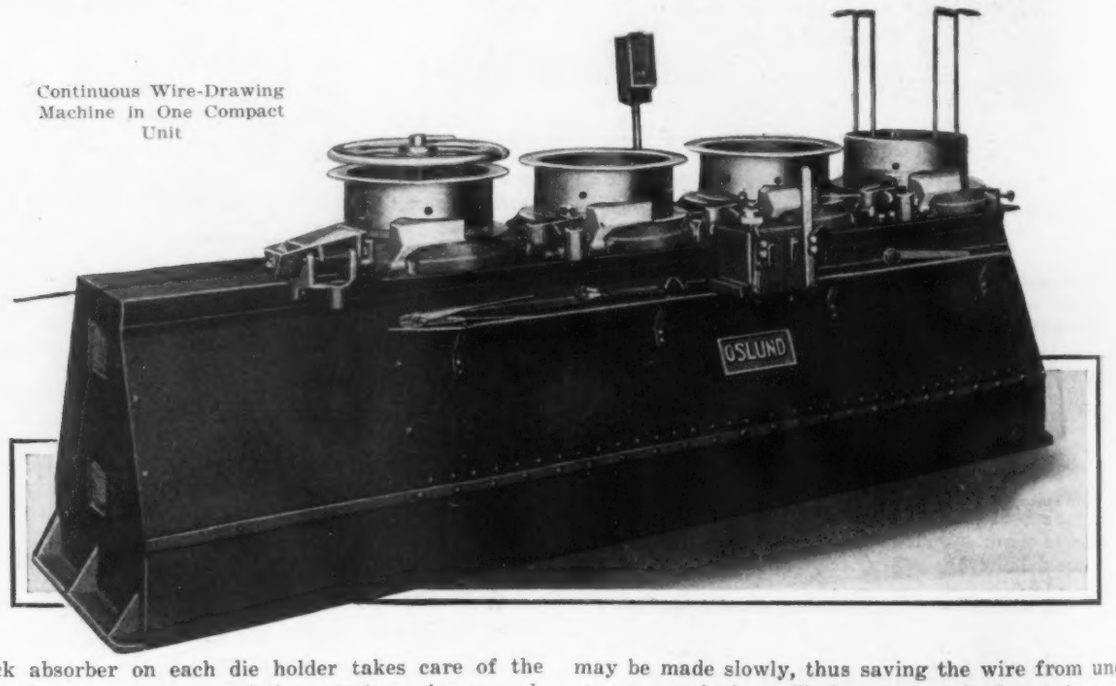
"The Seaboard Air Lines will issue and has arranged to place $4,600,000 6 per cent 15-year equipment trust certificates at par," said Mr. Warfield. "The proceeds, with other resources of the new company, will pay for 3000 of the 5000 damaged or bad-order freight cars to be immediately reconstructed by the Chickasaw Car & Shipbuilding Co., Birmingham, Ala.; also 1750 new steel underframe freight cars, 25 Mikado locomotives nearing completion by the American Locomotive Co., and two twin-screw steel, combination passenger and freight steamers ordered from Pusey & Jones Co., Wilmington, Del., for use between Baltimore, Md., and Norfolk Va.

The Southbridge Foundry Co., Worcester St., Southbridge, Mass., is operating its new one-story, 100 x 50 ft. plant: Frank S. Mills is president and general manager, and Alfred A. Allard, treasurer.

Oslund Continuous Wire Drawing Machine

Design Embodies Unique Arrangement of Differential Gearing to Maintain Wire Automatically Taut—Novel Pointing Device and Slow Starting Features

A MACHINE for continuous wire drawing has been brought out by the O. & J. Machine Co., Worcester, Mass. Several new features have been incorporated which differentiate it from previous attempts to effect the continuous process. The machine has four blocks, operating as a continuous unit and permitting the drawing of wire, in the one machine, down to one-half its entering diameter. An electric resistance pointing device provides a smooth conoidal point on the wire, in a fraction of the time usually consumed in pointing. Any one of the four blocks may be slowed down when, for any reason, this is desirable—as, for instance, when starting the wire upon the block. A spring shock absorber on each die holder takes care of the jerks due to unevenness of the entering wire or rod. The machine was designed by Charles H. Oslund, president of the O. & J. Company.



Continuous Wire-Drawing Machine in One Compact Unit

Three sizes of the machine are built, one being a rod machine, drawing down from No. 5 wire rod (0.207 in. in diameter) to 0.080 in. diameter, on four blocks. This may be considered as a roughing unit, its product being delivered, after annealing, to either one of the two finishing machines. The machine illustrated, with four drums, will draw 0.080 in. wire down to 0.041 in. The six-drum machine will draw 0.080 in. wire down to 0.034 in., or other desired size.

While the machine shown has four blocks, the design is not confined to that number—two, three, five or six may be used, according to necessity. But the point here is that the process is a continuous one. And the machine may be used with any one or any group of the blocks at work, thus providing a maximum of flexibility.

This continuous operation saves much labor. Instead of having to handle each coil of wire twice for each block, as in the usual practice, it is now handled twice for each machine—each four blocks, in the general run of operation—thus requiring only one-fourth the manual lifting of other practice. For the big machine, using 220-lb. coils, a special lifting device on the fourth block, with operating gears in ratio of five to one, makes it easy for one man to lift off the coil, swing it around, and deposit it on a truck, or on skids.

In the photograph of the assembled machine, the driving motor is in the closed compartment at the left, the gearing in the long closed compartment at the right. All four blocks and the motor are mounted upon the same cast-iron base plate, thus preserving alinement throughout. The pointing device, located just above the name plate, is convenient to all four blocks. But it usually suffices to point the wire twice, for, with care, the same pointing may be used twice. The hand wheel shown on the first (left) block permits such control of the speed, under power, that the beginning of the draw may be made slowly, thus saving the wire from undue stresses and the mill from many broken wires and much delay.

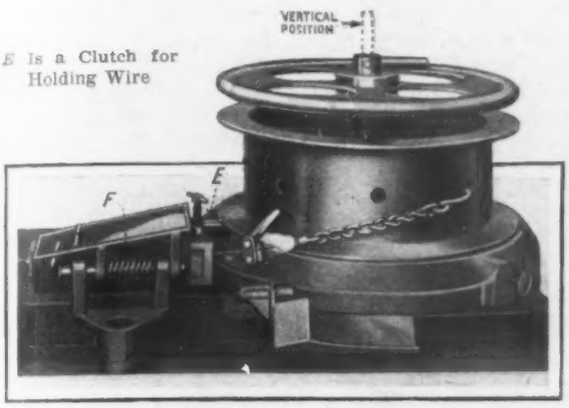
Driving is by electric motor, individual to each machine. This permits the operator to run each machine (one operator can handle four of these machines) at the speed best suited to the wire being drawn. Ventilation of the motor is provided by the screened "windows" shown at the end of the casing. For the smaller machine, drawing wire of 0.080 to 0.099 in. diameter down to 0.040 in. or so, a 5-hp. motor suffices. This may be compared with the estimate of 10 hp. for single blocks of previous types, and with perhaps 30-hp. average for four blocks. Thus the saving in power bills corresponds to that in labor of handling the coils. This low power consumption is due, it is explained, to the bearings and gearing used.

Differential drive gearing leading from the main driving shaft (geared down from the motor speed) is unique in design, and forms a novel arrangement for this purpose. It leads to the bevel gears which, finally, drive the individual blocks. The differential feature automatically compensates for the varying elongation as the wire is drawn through the successive dies, and at the same time automatically allows for the gradual wearing of the dies themselves. This is the outstanding feature of the entire design.

All driving gears are made of phosphor bronze.

The differential gears, of steel, hardened and heat treated, are of standard automobile design. In place of the usual long sleeve bearings, ball bearings are fitted throughout, not only on the main driving shaft from the motor, but on the jack shaft, the differential shafts and the ultimate spindles of the drums themselves. All bearings, gears and differentials run in an oil bath under dust-proof covers.

For providing a point to enter the die, the entering end of the wire, 8 or 9 in. long, is inserted tightly in

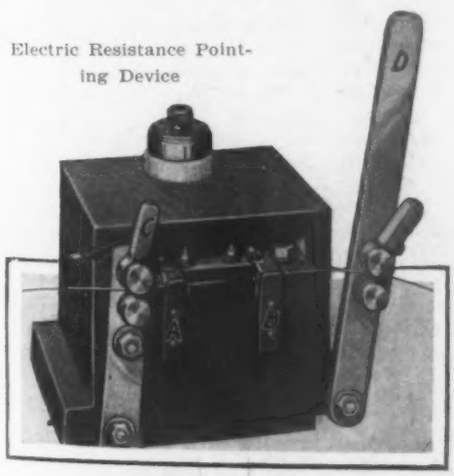


After Pointing, Wire Is Started on the Drum by the Chain Clutch, as Shown. The Die Block Has Spring Shock Absorber, *F*

the two contact terminals (*A* and *B*) on the pointing device, and held by tightening the clamp *C*, at left. Turning on the current heats the wire cherry red, when a steady pull on clamp *D*, at right, stretches it and breaks it with a conoidal point, as shown. This point is so smooth and free from burrs that insertion in the die is easy.

To enter the wire upon the first drum, it is caught by a grip as shown in the detail view, and carried slowly around the drum by power, the speed being under rigid control from the operator's hand on the wheel above. After seven or eight turns have been made, the machine is stopped and the leading end of the wire caught in the clip *E*, leaving enough free end

Electric Resistance Pointing Device



to start on the next drum. This next drum, in pulling the wire taut, pulls it from clip *E*, and the wire thus passes from the one drum directly to the next. This process is repeated, with intermediate re-pointing as necessary, until all four drums are operating, when the power is allowed to carry the work on continuously.

In the same detail view will be seen the spring shock absorber *F*, which saves the wire from danger of breaking and saves the dies from the jerks due to unevenness in the entering stock. This eliminates all spotty and cuppy wire. In operation, this take-up motion is in almost continual and very rapid action.

As the drums are of 16-in. diameter (50 in. or more circumference) and the fourth drum rotates at about 135 r.p.m., the speed of wire through the fourth die is about 550 ft. per min. This is a great increase over the usual finishing speed, and makes for heavy production per machine.

Effect of Sulphur in Rivet Steel

Tests to determine the effect of sulphur on rivet steel made at Watertown Arsenal and the U. S. Naval Experiment Station under the direction of the joint committee on investigation of effect of phosphorus and sulphur in steel of the American Society for Testing Materials have been entirely completed. Bars, flats and finished rivets from fourteen heats of open-hearth steel, carbon 0.09-0.16 per cent, varying in sulphur from 0.03 to 0.08 per cent, with one heat as high as 0.18, were tested in the natural condition "as received," in annealed condition and in quenched conditions. Publication of complete test data will be made through a technologic paper of the U. S. Bureau of Standards. In the meantime an abstract report of the tests will be released for publication by the society about March 1.

Information on Reclamation of Steel Sand

J. C. Davis, fourth vice-president American Steel Foundries, has generously placed at the disposal of the committee on molding sand research of the American Foundrymen's Association the information which has been collected by this company through years of investigation on the subject of cleaning and reclamation of molding sand. Because of the great amount of silica sand used and the scarcity of sand of the best properties, this company has been very active in developing equipment to clean the old sand accumulating in its steel foundries.

Reduction in Rates on Scrap Iron from Texas

The rates on scrap iron from Texas common points and Dallas group have been reduced 20 per cent to interstate destinations. The new rates, per 100 lb., are as follows:

To St. Louis territory	$0.32½
Chicago territory	0.40½
Kansas City territory	0.32½
Milwaukee territory	0.40½
Memphis territory	0.26

The request for reduction in rates from Texas was presented to the carriers by the Association of Waste Material Dealers, Inc., early in 1921 and was disapproved. It was again docketed by the carriers last September, and the carriers reversed their previous position.

Sharp Reduction on Tractors

CHICAGO, Feb. 3.—The International Harvester Co. to-day announced price reductions of $230 on two-plow tractors and $200 on three-plow tractors, effective immediately. Until May 1, next, the company will present to every farmer purchasing one of these tractors a two-furrow or three-furrow plow or a tractor disk harrow. Pesident Harold F. McCormick said: "This reduction is not justified by any present or prospective reduction of manufacturing costs. It is made chiefly to meet competition and enable our dealers to retain their position in the tractor trade. The burden of this reduction and the cost of the plows or harrows presented to purchasers will be borne entirely by the company."

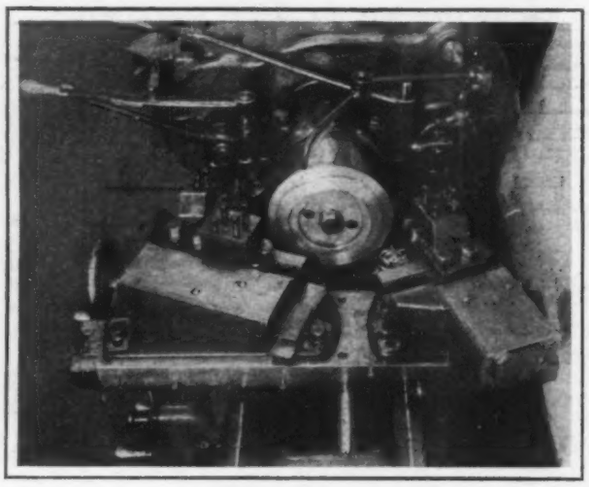
Consolidation of Chicago Jobbing Foundries

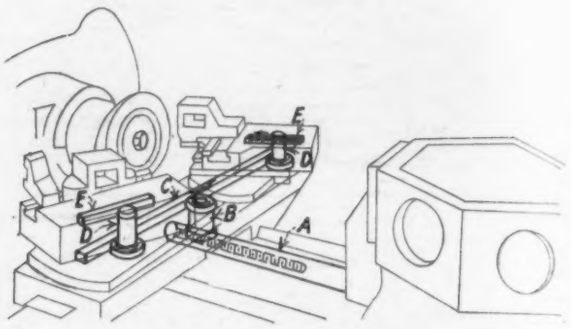
Negotiations are under way which may lead to the consolidation of six or eight Chicago jobbing foundries. Although the parties interested failed to come to an agreement on one merger plan submitted to them, negotiations were resumed with the probability that the consolidation will either be consummated or dropped within the next month.

Bevel Gear Attachment for Turret Lathe

The rapid reduction of forged bevel gear blanks has been a troublesome matter to the automotive industry because of the special steels used in this part of the automotive mechanisms. After considerable preliminary work the Warner & Swasey Co., Cleveland, has brought out an attachment on which a patent has been applied for, for use on its No. 3-A universal hollow hexagon turret lathe which, it is claimed, will materially reduce bevel gear costs. The attachment interchanges with the top slide of the regular carriage so that the machine may be used part time on other work or all the time on bevel gears alone.

The attachment is shown in the accompanying illustration. It is heavily and rigidly constructed to enable maximum cuts to be taken to the capacity of the cutter strength. It is universal for all standard angles





Attachment in Use on a Turret Lathe Is Shown at Left. Phantom view above shows component parts

up to its maximum work capacity of 14 in. diameter. The operation of the attachment is as follows: Two tool slides are operated by the hexagon turret and saddle. Rack A, which is mounted to the hexagon turret, engages double pinion B. When the turret is moved toward the head of the machine, rack A revolves pinion B in the direction shown. Pinion B engages rack C and transmits to it a sliding motion toward the rear of the machine and rotates two double pinions D which engage with racks E, fastened to the tool slides. The front slide operates on one side of the gear, the rear slide on the other, and both operate at the same time.

The makers believe that many automotive shops, gear manufacturers and others can operate a No. 3-A universal hollow hexagon turret lathe with this attachment either part or full time very profitably.

Cost of Producing Chinese Pig Iron in 1919

The Hanyang Iron and Steel Works, Hanyang, China, draw their iron ore from their own mines at Tayeh. The cost of production at Tayeh in 1919 according to the London *Ironmonger* was below $2.80 per ton, but the transportation to Hanyang cost $0.85, which, together with other expenses, brought the cost up to about $4 per ton at the furnaces. This cost has since been lowered by smelting the ore at Tayeh but an allowance must be made for the coke which has to be taken to Tayeh. As nearly equal quantities of coke and of ore are used in the furnaces, the saving effected in transportation is not of much significance. Limestone also comes mainly from Tayeh. The cost per ton at the Hanyang furnaces varied in 1919 between $2.32 and $3.81. These figures include all transportation and overhead charges. Manganese comes from the company's mines at Changlai and Yangshin. These two items amounted in 1919 to 3 or 4 per cent of the total cost. The laborers are divided into foremen, mechanics, regular laborers, and helpers who are paid by the day. The wages of some foremen are as high as $100 a month, the mechanics receive about $20, the regular laborers from 8500 to 9000 cash per month, and the helpers 200 cash a day. The total cost in direct labor is from 0.8 to 1.4 per cent of the cost of iron production.

German Foreign Trade Recovering

WASHINGTON, Feb. 7.—Whether or not expansion of German foreign trade is to continue without interruption is to be determined by the future, but that it is making a recovery is evidenced from a report received by the Department of Commerce from Commercial Adviser Herring, Berlin, who points out that German foreign trade figures for December showed the first favorable balance recorded for 1921. In November a decrease was noted in the prevailing adverse balance, imports being valued at 12,278,000,000 paper marks and exports at 11,912,000,000, but December showed an actual favorable balance in paper marks of 900,000,000. The December imports amounted to 2,090,000 metric tons, valued at 13,700,000,000 paper marks, and exports amounted to 1,930,000 metric tons, valued at 14,600,000,000 paper marks. Although the trade balance by volume is slightly unfavorable, the values show the favorable balance indicated.

Compromise with Molders

The Cincinnati local of the International Molders' Union, in conference with the union foundry employers of Cincinnati, reached a compromise in the matter of wages to be paid in the future. The employers had recently reduced the pay of the union workmen to $5 a day, whereupon the molders quit work. They had been receiving $6 for eight hours work and in the compromise a wage of $5.50 will be the scale in the future. A plan to prevent strikes in the foundry industry is now being worked out and is expected to be in operation within the next 30 days. Union shops are taking on a few men, but general conditions are such that only about 200 molders are now employed in the city. As a result of the strike, two large union shops have now declared for the open shop and will in the future be run on that basis.

Radio Telephones Popular

SEATTLE, Feb. 1.—The Pacific Northwest has become infatuated with the radio telephone idea, and with one of the daily newspapers equipped with a sending apparatus of five watts, 5000 receiving instruments have been brought within reach of the nightly concerts and news bulletins, and the number is increasing rapidly. The demand for the magavox, vacuum tubes, copper wire and other essentials has kept the radio companies stripped, and during the past 60 days fully 50 per cent of these units have been out of stock. There are many amateur sets, but equipment running up to $250 and $300 is being installed in many public places and homes.

Secretary Hoover Speaks for the Public

Addresses the Interstate Commerce Commission, Favoring Reduction of Freight Rates on Raw Materials— Shows Progress of Deflation

BY L. W. MOFFETT

WASHINGTON, Feb. 7.—Reduction in freight rates on coal, metals, wood, and agricultural and other producer's goods to the bottom before less-than-carload and class rates are touched, was advocated by Secretary of Commerce Herbert Hoover, when he appeared before the Interstate Commerce Commission last Friday afternoon, for the Chamber of Commerce of the United States, as a witness for the public. The Secretary of Commerce expressed opposition to a general reduction in rates and declared that an economic analysis of the country's industry will show that less-than-carload and class rates are far too low compared to rates on primary commodities. His suggestion, if adopted, would mean a great relief to the iron and steel industry.

"With the gradual return of the traffic to normal, with decreased operating costs, relief in rates will be available, and it would be an economic crime to apply such relief by horizontal reductions to all rates thus giving relief to higher priced goods and travel, when the vital parts of our economic life, our agriculture and fuel and metals, are choked," Mr. Hoover declared.

In approaching the question of readjustment of railroad rates, Secretary Hoover submitted a table in which he compared present prices of commodities and wages paid in various industries in 1913, which were given the index number of 100. This table showed a marked deflation in iron and steel and non-ferrous and agricultural lines and the maintenance of inflated prices in other lines, particularly in the retail trade. Some of the price index numbers were as follows: Steel billets, Pittsburgh, 113; copper 68, the lowest of all; zinc, 90; pig iron, Pittsburgh, 128; bituminous coal at mine, 160; bituminous coal retailer, 198-220; retail clothing, the highest of all, 213; farm crops at the farm, 98, and all animals at the farm, 92.

Approximates of wage scale index numbers included steel industries, 150; metal trades, 218, the highest in the list; building trades, 190; railroads, 200; coal mining scales, 183 and farm labor, 135.

Inequalities Shown

This table was cited to demonstrate the inequality in prices and wages between different groups of commodities, the great increase in spread between "producer's and consumer's goods and the lag in wage scales." It was pointed out that as the population engaged in the "deflated" producer's goods—agriculture, and metals, wood, etc—comprises one-half the total in number of the nation, their power to buy the same ratio of consumers goods has been reduced to less than 70 per cent of pre-war, and is the consequent cause of a large part of the industrial and commercial unemployment and stagnation in our cities and our transportation.

It was declared by Secretary Hoover that the violence of the country's readjustment is without parallel and that it is necessary to predicate all plans for the future on the ultimate return of the American people to a normal economic activity with annual progress in the expansion of production of plant and equipment, of skill and efficiency. He insisted that there can be no question that this return will take place, and that no responsible body will approach the problems on any other basis.

"The greatest impulse that can be given to recovery from any source whatever is a reduction of rates on primary commodities combined with the immediate resumption of railway construction and equipment." Mr. Hoover said. "The first depends upon reduction of operating costs, the second upon restoration of credits for our railways."

Mr. Hoover continued:

> One thing is absolute. Our transportation facilities are below the needs of our country, and unless we have a quick resumption of construction, the whole community—agricultural, commercial and industrial—will be gasping from a strangulation caused by insufficient transportation the moment that our business activities resume. For the past five years, we have had no consequential expansion to our railway transportation machine. With but one interval of 9 months in 1918 and 1919 we had a car shortage throughout the whole of the years 1916-17-18-19 and 20. This shortage rose to as high as 160,000 cars with a corresponding shortage of motive power. We paid tremendous sums in commercial losses and unemployment in consequence. We laid it onto the war. We should lay it onto our lack of foresight and antagonism to railroads.

Needs of Railroads

Mr. Hoover said that experience of the 20 years before the war has shown that it is necessary to build an extension of lines, including terminal facilities, additional sidings, etc., every year equal to the construction of a new railroad from New York to San Francisco. He said it will be necessary to add at least 120,000 cars and 2500 locomotives annually to equipment, and that since the United States entered the war in 1917, the country has constructed at least 10,000 miles of railways less than the increasing population and economic development called for and that the nation is behind in rolling stock by about 4000 locomotives and 200,000 cars. He emphasized the fact that unless there is an immediate resumption of construction and equipment, the community will pay treble the cost of the whole of them in their losses of a single season.

The Secretary of Commerce said that there is nothing so irrecoverable a loss to the United States as idle shops and idle men, both of which, it was stated, exist to-day. At the same time, he asserted that there is nothing that will so quickly start the springs of business and employment as an immediate resumption of construction and equipment of the railroads.

When Business Resumes

"When business does resume," the Secretary pointed out, "we shall need all of our capacity for the production of consumable goods. We shall not only find it strangled for lack of transportation, but we shall find ourselves plunging into the manufacture of this very railway equipment and construction in competition with consumable goods for materials and labor. Herein lies the basic cause of destructive price inflation and booms, with all their waste and over-expansion. In times of depression we should prepare for the future and by doing so we can cure the depression itself."

Turning to the fundamental reason for failure to resume equipment, the Secretary assigned the cause to the loss of confidence in railroads as an investment, and the competition of tax-free securities. In this connection, he urged government guarantee of equipment trust certificates of the railroads, accompanied by "a courageous program of broad-visioned betterment." Mr. Hoover said this program would not cost the taxpayers a cent or result in loss to the Government. He maintained that by providing the carriers with a means of obtaining money to prepare adequate transportation facilities large savings would result in the end.

The Present Situation

Dealing with the present rate situation, Secretary Hoover said that the last five years of changing administration, irregular traffic and widely fluctuating wages and prices of materials give but little reliable historical criteria upon which to base the future. He said

that the country is in the midst of violent economic readjustments, of a profound industrial depression, and that the Commission, therefore, will need to temporize with the situation for some time. Its conclusions, he asserted, may well fall into three periods: first, the immediate present; second, during the early period of decreasing costs and increasing efficiency and slowly recovering traffics; and, third, normal operations.

Discussing the immediate present, the Secretary pointed out the financial condition of different groups of railroads and said that he believes there are cases where earnings could be increased by lowering rates and asserted that no one can review the testimony given before the commission during the past few weeks without concluding that the rates in special instances are stifling business. These directions are perhaps not important in the whole problem of rates, the Secretary said, but that he was convinced that lower rates would recover lost traffic, such as export coal, substitutions in building materials, gains in water competition, etc.

Taking up the second period during 1922, Secretary Hoover said that he had the feeling that the railroads will agree that all these savings should be instantly devoted to relief in the rates on primary commodities in order to expedite the recovery that can only come through a decreased spread between producer's and consumer's goods. He said that he recognized that the uncertainty and slow reduction of rates in this fashion will itself delay business recovery because of the uncertainty of business as to its future costs. It was declared that if the railroads were in position to stand the temporary shock it would be infinitely better to drop the rates on primary commodities to-morrow, and that business recovery would come faster. He added, however, that "we cannot ask the impossible."

Looking to Normal Times

As to the third question, Secretary Hoover said that looking further to normal times, a rough calculation that present wages and costs at, say 50 per cent above pre-war, would show that the railways can earn somewhere around $1,500,000,000 in excess of the 6 per cent minimum upon tentative valuation.

"As I have stated," said Mr. Hoover, "relief is first most critically needed in the rates on primary commodities.

"Some estimates given to me," continued the Secretary, "indicate that approximately 35 to 40 per cent of revenues are involved in the groups more urgently needing relief. I think it will also bear calculation that in the income assumed above that primary commodities can eventually be reduced to prewar rates, and still place earnings upon a basis that will inspire such confidence in investors as will secure free flow of investment capital into construction. It is not to be expected that capital for these purposes will be available at the rate that does not exceed the tax-free securities at least 2 per cent to 3 per cent."

CENSUS FACTS NEEDED

House Committee Refuses to Make Appropriation for Publication

WASHINGTON, Feb. 7.—While for probably the first time in the history of the Bureau of the Census blanks for the census of 1921 have been prepared in almost the exact form desired by the various industries of the country to produce the facts wanted, their purpose largely will be defeated, it is maintained, unless the House Committee of Appropriations is persuaded to change its course. The committee has refused to make an appropriation to tabulate the returns and publish the results. The consequence would be that the facts would be unavailable to the industries.

By reason of this situation, the National Association of Manufacutrers has addressed a letter to secretaries of trade associations urging them to get behind a movement to see that the necessary appropriation, amounting to only $986,440, is made. The subcommittee of the House Committee on Appropriations having the matter in charge is composed of Representatives Milton W. Shreve, Pennsylvania (chairman); Elijah C. Hutchinson, New Jersey; Charles F. Ogden, Kentucky; William B. Oliver, Alabama, and Anthony J. Griffin, New Jersey.

The letter from the National Association of Manufacturers points out that under the act of March 3, 1919, provision was made for taking the census of manufactures for the years 1921, 1923, 1925 and 1927, and every tenth year after each year named, instead of every five years, as heretofore, and after stating that blanks prepared are in accordance with wishes of industries of the country, tells of the action of the House Committee on Appropriations in refusing to appropriate the necessary money to make the facts available.

"It is well known that the census of manufactures for the year 1919, taken in the year 1920, was under inflated conditions and this census of 1921 is doubly necessary in order that industry may be accurately informed," says the letter. "It is vitally necessary to the industries of the country that production statistics, currently gathered, may be promptly available. In these times the business man who does not have all the available facts is in the position of the farmer with a thermometer but no calendar or almanac."

President Edgerton's Letter

Interest of industries of the country in the Department of Commerce, particularly the Bureaus of Standards, Census and Foreign and Domestic Commerce, and the desire that they be supplied with adequate funds, is pointed out by President John E. Edgerton of the National Association of Manufacturers in a letter to Secretary Hoover. Mr. Edgerton states that the manufacturers, "while strong for all proper provisions of economy in governmental expenditures, are extremely desirous that most careful consideration be given to constructive proposals which may tend to repair the damage done to our economic and industrial structure by the serious years through which we have lately passed," and declares that the Secretary's estimates of necessary expenditures for the Department of Commerce for 1923 "appear to be most modest and have our hearty support. I observe with distinct appreciation that you are directing the activities of your department to those lines of work most essential. I am astonished at the fact that the proposed appropriation for your department is only one-half of 1 per cent of the total amount requested by all executive departments for 1922-1923." The Secretary's estimate was approximately $23,000,000 and this was cut down about 16 per cent or to about $19,400,000 by the Bureau of the Budget.

"This is all the more striking," says Mr. Edgerton in commenting on the relatively small estimates of Mr. Hoover, "when it is remembered that the manufacturing industries of the country, in 1918, paid 67 per cent of all of the income and profits taxes collected by the Federal Government and that they paid into the Federal treasury approximately 45 per cent of their total net receipts."

Speaking especially of the work of the three bureaus mentioned, Mr. Edgerton says the service done to industry by the Bureau of Standards could not be duplicated and that if its work could be figured in dollars and cents, the benefits to the community from its service would run into many millions. With regard to the Bureau of Census, Mr. Edgerton says its work in the past interested him only slightly, "but is now headed in a new direction and is beginning to compile statistical information that is not only interesting to the general public but extremely useful to the business community. Someone should have thought of this use of census machinery before."

The statement in THE IRON AGE, Jan. 12, that the electric furnace of the electro-metals type in Ireland's first electric steel foundry was the same type as the Greaves-Etchells in the United States was an error. The two types are distinct and the latter is an active competitor with the former in Great Britain.

Pittsburgh Base Called Controlling Factor

Hearing Before Federal Trade Commission Continues at Milwaukee, Manufacturers Claiming Adding of Freight Is Unjust

MILWAUKEE, Feb. 6.—Samuel H. Squier, president Milwaukee Electric Crane & Mfg. Co., testifying Monday at the resumption of the hearing on the Pittsburgh basing point practice before the Federal Trade Commission, expressed the belief that price difference brought about by this practice is a controlling factor in the rolled steel business now and in more normal times is an important factor. He said the practice created conditions of unequal competition when his shop bid for work against shops located nearer Pittsburgh, inasmuch as his concern had to pay a freight rate of 41.5c. per 100 lb. from Pittsburgh to Milwaukee, placing it at a disadvantage over competitors paying lesser freight charges due to advantageous geographical location. Citing the case of a competitor located in Alliance, Ohio, to which point the freight rate is 12.5c. from Pittsburgh, Mr. Squier said that, assuming both bought steel for the same price and paid freight from Pittsburgh, the Alliance shop could lay down its product almost anywhere in the United States at a price advantage excepting only in Milwaukee, where the Alliance concern would be at a disadvantage of 10c. per 100 lb. In Chicago the Alliance concern, Mr. Squier testified, would have a price advantage of 14c. per 100 lb., other conditions being equal. At St. Louis the Alliance shop would have an advantage of 22c., Duluth 14.5c., Minneapolis 9.5c., Seattle and San Francisco 12.5c., Kansas City 0.5c. per 100 lb. Mr. Squier said a typical crane made by his concern sold for $6,500, representing an average profit of 15 to 20 per cent, but about $125 of otherwise legitimate profit usually had to be sacrificed because of unearned freight charges imposed by the Pittsburgh basing point.

Mr. Dieckelman Testifies

R. P. Dieckelman, secretary Pressed Steel Tank Co., West Allis, the only other witness called Monday, did not complete his testimony owing to lack of time. He testified that his concern consumes 18,000 tons of sheets and plates annually in manufacturing standard and patented steel tanks, drums, barrels, etc. Business in the standard line was restricted principally to Western territory because of disadvantages imposed by the Pittsburgh basing point in competing in territory East of Chicago. On patented articles, however, the disadvantage obviously was not so great, he said, because selling prices were not controlled so closely as on standard products, which are in open competition. Mr. Dieckelman said that, assuming his concern's competitors at Sharon, Warren or Niles bought material at Pittsburgh plus as he did, and all other conditions were equal, the fact that these shops pay a freight rate of only 10.5c. per 100 lb. from Pittsburgh, provided them with an obvious advantage in selling standard articles in competition with the Milwaukee shop paying 41.5c., Pittsburgh to Milwaukee, plus the freight on the finished goods, when back routed.

Cross examined by counsel for the Steel Corporation, Mr. Dieckelman said that, roughly speaking, his company's business was divided into 60 per cent patented and 40 per cent standard products over a five year period just past. In a previous five year period, patented articles represented 75 per cent and standard 25 per cent of the total sales. War requirements, he testified, had an important bearing on the change in the nature of production, more standard articles having been made in the more recent five-year period. In the Eastern territory, he said, only the patented articles were salable in competition with Eastern manufacturers, and at present about 20 per cent of the business in patented products was being done in territory East of Chicago.

Progress Made Slowly

At the close of the first week's sessions of the hearing conducted at Milwaukee by the Federal Trade Commission on its complaint seeking the abolition of the Pittsburgh basing point practice at the instance of Western rolled steel consumers, only a small percentage of witnesses offered by the consumers had been heard. Progress of the hearing has been slow due to the desire of both parties to the action to delve as deeply as possible into fundamentals, which process involved many instances of intimate inquiry respecting volume of materials consumed, prices paid, profits or losses established, and similar details.

The general tendency on the part of witnesses to indulge in speculative statements regarding the alleged discriminatory effect of buying steel f.o.b. Pittsburgh, regardless of the point from which the material was actually shipped, was sharply opposed by counsel for the respondents, the United States Steel Corporation and subsidiary companies. Efforts of counsel for the Federal Trade Commission to induce witnesses to tell of discriminatory effect when based on facts and figures generally were permitted.

At one time, when Frank R. Nanscawen, service manager of the Heil Co., Milwaukee, was on the stand and contended that the abolition of the Pittsburgh basing point would enable manufacturers in Milwaukee to compete on equal terms with Eastern fabricators, while under existing conditions the adverse effect is sufficient to keep Western manufacturers from competing in territory more geographically favored, counsel for the respondent engaged in a legal controversy with counsel for the commission which was settled when Commissioner Houston Thompson, presiding at the hearing, questioned the witness: "If it were not for the alleged additional price necessary through the operation of the Pittsburgh basing point plan, could you compete in the Pittsburgh market?" The witness answered, "Yes." A motion that all of Mr. Nanscawen's testimony be stricken from the record was denied by Commissioner Thompson.

How the Cost Is Increased

A. G. Henricks, vice president and general manager Pawling & Harnischfeger Co., Milwaukee, in his tesimony asserted that the additional cost of material due to payment of freight rates from Pittsburgh to Milwaukee which were not actually paid by the manufacturers, caused the cost of the finished product to be increased, making Milwaukee fabricators unable to compete in Eastern markets with Eastern concerns excepting at a sacrifice of profits. He said that on Oct. 26 the Pawling & Harnischfeger Co. bid on a job for the National Radiator Co., making a price of $3950. The Cleveland Crane & Engineering Co. entered a bid of $3,900. Mr. Henricks asserted that his company was required to pay approximately $60 in freight charges from Pittsburgh to Milwaukee on the material entering into the product, although the material was derived from the Gary or Milwaukee mills of the Illinois Steel Co. This requirement enabled the competitor to underbid.

Julius P. Heil, vice president of the Heil Co., who was recalled to analyze invoices and contracts introduced in evidence during his original appearance on the stand, testified that while these showed that material was purchased f.o.b. Milwaukee, all prices represented a base price f.o.b. Pittsburgh, with freight from Pittsburgh to Milwaukee added. Most of the invoices covered material shipped from the Chicago district

while in several instances the material was hauled from the Milwaukee mill of the Illinois Steel Co. by the Heil Co.'s own trucks to the Heil plant in Milwaukee.

Invoices Presented

C. J. Heil, purchasing agent of the Heil Co., presented invoices covering purchases of rolled steel from so-called independent producers located in Chicago, Cleveland, Indiana Harbor and Buffalo, all of which were based on Pittsburgh plus. Counsel for the Steel Corporation objected to admitting this evidence into the record because the concerns involved are not named in the present case. Commissioner Thompson, however, overruled the objection after K. E. Steinhauer, counsel for the commission, explained that he proposed to show that the Pittsburgh plus system was a general practice which tended to lessen competition.

H. C. Banks, of the Interstate Drop Forge Co., Milwaukee, testified that, assuming the labor and overhead costs of a Pittsburgh competitor are the same, his company can only compete with such competitor for business in Milwaukee by sacrificing part of its profits. He said steel was purchased on a Pittsburgh basing point and there is from 50 to 60 per cent wastage in fabrication. Since the freight rate from Pittsburgh to Milwaukee is the same on finished products as on raw material, a Pittsburgh competitor is able to deliver his products in Milwaukee at a lower price than this Milwaukee concern.

Carl F. Garny, purchasing agent E. R. Wagner Mfg. Co., North Milwaukee, steel stampings and hardware specialties, testified that in the instance of a certain line of automobile parts his company was compelled to reduce its profit 7 to 8 per cent in order to meet Eastern competition in territory east of Chicago. Counsel for respondent asked if this item was not selected for illustration because it showed a small percentage of profit, which was denied by the witness. Extension of questions into the rate of dividends paid by the Wagner company over a period of years met with the refusal of the witness to answer on the point of personal privilege.

FIGURING BAR STEEL WEIGHTS

Handy Rules for Quick Calculations of Hexagons, Rounds, Squares and Flats

BY W. F. SCHAPHORST, M.E.

When engineers and other users of steel rods and bars want to know the weight of bars of given diameter and length, they want to know quickly. Tables are not always available, and accurate formulas are used with too much difficulty. Here are some quick and surprisingly accurate rules based upon Hyman Levine's formulas:

Rule 1—*Hexagon bars:* Square the distance (in inches) across flats; divide by 4. The answer is the weight per inch of length.

Rule 2—*Round bars:* Square the diameter in inches; multiply by 2; divide by 10; add 10 per cent. The answer is the weight per inch of length.

Rule 3—*Square bars:* Square the distance (in inches) across flats; multiply by 3; divide by 10; subtract 1/20, or 5 per cent. The answer is the weight per inch of length.

Examples

Example 1—Hexagon bar, 100 in. long.
Distance across flats, 2 in.

Applying Rule 1:
$2 \times 2 = 4$
$4 \div 4 = 1$ lb. per inch of length.
$1 \times 100 = 100$ lb., the weight of the hexagon bar.

Example 2—Round bar, 100 in. long.
Diameter, 3 in.

Applying Rule 2:
$3 \times 3 = 9$
$2 \times 9 = 18$
$18 \div 10 = 1.8$
Adding 10 per cent,
1.8
0.18
1.98 lb. per inch of length.
$1.98 \times 100 = 198$ lb., the weight of the round bar.

Example 3—Square bar, 100 in. long.
Distance across flats, 1.5 in.

Applying Rule 3:
$1.5 \times 1.5 = 2.25$
$2.25 \times 3 = 6.75$
$6.75 \div 10 = 0.675$
1/20 of $0.675 = 0.03375$
Subtracting
0.675
0.03375
0.64125 lb. per inch of length.
$0.64125 \times 100 = 64.125$ lb., the weight of the square bar.

It will be noticed that each of the above operations is very simple—so simple that most of them can be performed mentally—such as multiplying by 2, dividing by 10, dividing by 20, squaring, etc. Also, they are easily remembered. A rule of thumb is not much good unless it is simple and can be remembered.

In case one should forget the above rules, here is an excellent one by Professor Merriman, which the writer has carried around in his head for 16 years: "A bar of steel 1 in. square and 1 yd. long weighs 10 lb." This rule is good because it is easily remembered, and it is easily remembered because it is so simple. Professor Merriman's rule becomes useful at any time as a basis on which to figure round, hexagon or any other kind of steel rod.

Editor's Note: For a flat bar of rectangular cross section, Rule 3 will apply, with this modification: Multiply width by thickness, instead of squaring distance across flats.

Example 4—Flat bar, 100 in. long.
Section 3 x ½ in.

Applying Rule 3:
$3 \times \frac{1}{2} = 1.5$
$1.5 \times 3 = 4.5$
$4.5 \div 10 = 0.45$
1/20 of $0.45 = 0.0225$
Difference 0.4275 lb. per inch of length.
$0.4275 \times 100 = 42.75$ lb., the weight of the flat bar.

For more exact results, it may be noted that Rule 1 gives an answer about 2 per cent too high; Rule 2, about 1 per cent too low; Rule 3, about 0.6 per cent too high. Anyone desiring this greater degree of exactness may obtain it by decreasing Rule 1 answers by 2 per cent; increasing Rule 2 answers by 1 per cent; decreasing Rule 3 answers by 0.6 per cent.

Arousing the Farmers

Opposition to Pittsburgh "plus" was urged by James Nicols, president of the State Farm Bureau of Michigan, in a recent address before the beet growers of that State at Saginaw, Mich. The speaker directed the attention of his audience to the hearings on the Pittsburgh basic point practice before the Federal Trade Commission in Milwaukee. For two years the American Farm Bureau Federation has been active in opposition to the Pittsburgh plus practice, on the grounds that it increases the prices which farmers must pay for farm machinery, wire fence, etc.

The Ohio Structural Steel Co., Newton Falls, Ohio, was recently referred to in THE IRON AGE as having established a plant to handle structural steel work of a not too complicated nature. This was incorrect, as the company is fully equipped to handle all kinds of structural steel and has been fabricating bridges, buildings and steel oil derricks, for the past three years.

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Variegating the Mills Product

In the years of heavy new construction in the steel industry before the war, a strong tendency was exhibited for the steel mills to variegate their output. The large independent steel companies seemed dissatisfied unless they could feel that they were making progress toward the position of producing a "full line" of steel products. America being a country, and that being an age of specialization, a definite defense for such a policy was needed, and the defense was furnished partly by the plea that sales offices had to be maintained and might as well have a wider variety of goods to sell, and partly on the ground that the relative demand for different products varies from year to year, so that a steadier total volume of business could be maintained by its being possible to put steel into one product or into another.

While there is no particular satisfaction in being engaged in the manufacture of any description of steel these days, it is plain that activity is better distributed among the different steel producers now than would be the case if they had not variegated their output. Rails, shapes, plates and bars have been and are in especially poor demand, but tin plate, pipe, sheets and wire products have been in good demand, relatively speaking. Only two of the really large independent steel companies, however, produce tin plate. Perhaps there are some who regret that, in their desire for "tonnage" products, they overlooked tin plate.

There has always been more or less debate as to the relative merits of the highly specialized mills on the one hand and the more general purpose mills on the other, and thus the question of variegating output has come up in connection with individual mills or trains of rolls. For the highly specialized mill it has been argued that it can make long runs on a size, with correspondingly lower cost, while for the general purpose mill it has been argued that there is more chance for the salesman. A highly specialized case of the general problem is now presented, for there are no orders going these days that furnish long runs. Buyers are ordering material in the hand-to-mouth style, and specifications even for single carload orders usually involve quite a mixture. At the same time the need for producing at very low cost is particularly pressing.

An interesting question arises whether, in these days of strenuous search for outlets for steel in finished products, mills will be more disposed than formerly to carry their rolled products into manufactured articles. Already one steel producer or another makes freight cars, cold finished steel bars, well drilling rigs, railroad spikes and forgings, but in general the mills have preferred to let their customers make these things. The great objection to extensions of this description at the present time is that it is difficult to build up trade when there are not enough orders to satisfy the sellers already in the field. There is left to the mill the chance of developing some entirely new product which with its organization it can push to advantage.

Coal Labor Conditions

The general opinion is that there will be a suspension of mining at the union bituminous coal mines April 1, when the present wage agreement expires, and that the chief point at issue will be the check-off. The event may prove otherwise, but this is the common expectation in the trade at present.

Attention is naturally focused on the Pittsburgh district, which in the past has been the pivotal region in bituminous wage matters. A fortnight ago the Pittsburgh operators announced a wage scale which they intend to post at their mines rather than present to the national officials of the United Mine workers. Study of the rates named has led to the conclusion that the miners cannot seriously object on that score. On the basis of the pick mining rate for thin-vein mines, the scale is 31 per cent below the existing scale, which is a very high one, and has lost the union mines most of their trade; it is equal to the scale of April 16, 1917, 19 per cent above the scale obtaining April 1, 1912, to April 1, 1916, and somewhat more than double the rates paid in 1896.

From the present appraisal by the trade, the chief matter in controversy will be the check-off rather than the wage rates. The situation as to the check-off cannot be understood without a review of

the history of this institution, unique as concerns the United States, since it prevails nowhere but in coal mining. The check-off may be said to represent automatic unionism, for when a man becomes an employee of a coal operator who has signed the scale, he becomes thereby a member of the union, since his dues and fines and initiation fee, if any, are deducted from his pay and remitted by the operator to the district organization of the United Mine Workers.

A quarter century ago, the coal industry was full of strife. There were union mines and non-union mines, and in the Pittsburgh district they were almost side by side. The competition was very keen, the non-union mines paying rates which on paper were much below union rates, while the union operators endeavored to save themselves by the profits of their "company stores." The latter were unable to rid themselves of the union or to compete successfully with the non-union operators. From this, apparently, arose the check-off. If there had to be a union, it seemed better that the conditions be the same for all operators.

After more than 20 years of the check-off, however, the bituminous coal industry as a whole is found to be about two-thirds union and one-third non-union, and in the past twelvemonth the non-union mines have been producing the bulk of the coal the country has called for. For more than a year, a number of coal operators have been under indictment for being in a conspiracy with the United Mine Workers, the chief basis of the charge being the payment of the check-off by the operators and the use, at non-union mines, the United Mine Workers are charged with having made of the money thus obtained.

Considering the history of the check-off and the conditions now existing, it seems entirely probable that the operators will be absolutely firm in their stand against continuing the system. While the officials of the United Mine Workers are irreconcilable to any other method of financing their union, the miners themselves are understood to be lukewarm, with not a few definitely opposed to the check-off. As the operators are placing the scale, with its conditions, directly before their employees, it may be that the attitude of the men will prove more important than the attitude of the officials of the union.

Mechanical charging of electric steel furnaces, particularly those of moderate to large capacity, is especially necessary if the electric process is to compete with the open-hearth on any large scale. The description in THE IRON AGE last week of a special 7-ton furnace adapted to mechanical charging reveals the trend in this direction. Most types of electric furnaces, large and small, are not charged mechanically with cold metal, unless by removing the roof, which is rare. While the furnace referred to was made for a special use, the change has long been contemplated and may be said to connote the really large electric steel furnace of 80 to 100 tons capacity. Hot metal charging would, of course, commonly obtain, but in many installations mechanical charging of cold metal would be the only practice. The engineering problems of the large electric furnace appear to fall under solution fully as fast as the economic or commercial place of the furnace is established.

Secretary Hoover's Address

The first point to be noted in connection with the address of the Secretary of Commerce Hoover before the Interstate Commerce Commission last Friday was that an advocate of the public, regardless of any special interest, was invited to appear before the commission and accepted the invitation. Reams of testimony have been taken in the railroad rate investigation in behalf of the shippers and the railroads. Secretary Hoover spoke for the people in general in not asking any special consideration, but wishing to promote the public welfare and restore prosperity as soon as possible.

After showing the great need for new equipment, including 120,000 cars and 2500 locomotives annually to make up the shortage, Secretary Hoover more than hinted that it might be well for the Government to guarantee equipment trusts, which, he said, was not a proposition to take money from the taxpayer, but to save him from paying treble the amount of his guarantee in profiteering and losses.

The Secretary evidently has little patience with the proposal to give credits to foreign countries; he prefers to give it at home, and one of his most significant sentences was that in which he declared: "I wish to say with all responsibility for the statement, that a billion dollars spent upon American railroads will give more employment to our people, more advance to our industry, more assistance to our farmers, than twice that sum expended outside the frontiers of the United States—and there will be greater security for the investor."

The description of the "veritable witches' cauldron being fed constantly with hates distilled from the misdeeds of railroad promoters in the past, from the conflicts between the railroads and the farmers, between the railroads and their workmen," was most impressive and all will agree with the Secretary that it is time to "call off the witches." Surely nothing is to be gained by raking up the scandals of the past, by criticizing those who managed or mismanaged railroads during the war when such tremendous demands were made.

As to the method of readjusting rates, the Secretary advises the policy of caution. He shows how the tendency, as in the case of the raw products used in the manufacture of pig iron, is to force industries to move toward the raw materials and shows how this tendency is deplorable, but also indicates that there must not be sudden changes. It may even be necessary in some cases to advance rates on less than carload lots of some finished products while the rates on coal, metals, wood, agricultural and other producers' goods should be promptly reduced. The Secretary indicates that in considering the situation, the fact that the present earnings are very close to bond obligations must not be overlooked, and readjustment must now be made with regard

to the immediate present. An early period of decreasing costs and increasing efficiency and slowly recovering volume of traffic will bring us later in 1922 to normal operations. The Secretary points out that great social and economic problems find their solutions slowly and by process of trial and error. This country has committed errors enough and should now be able to act wisely. Certainly, as has been pointed out in these columns and also by Secretary Hoover in his address, prosperity cannot be restored by a horizontal reduction of railroad rates.

At this critical time the people of the country are fortunate in having as able an advocate as the Secretary of Commerce. His address should be of real assistance in solving the rate problem in such a way as to bring the greatest relief.

Progress in Centrifugal Casting

The centrifugal casting of metals and alloys has been making rapid strides. It has now covered the handling of steel, one of the most difficult metals to cast centrifugally. The secret of the solution of the steel problem, discussed elsewhere in this issue, is the use of a very hot revolving mold. This appears to have made easy the production of steel tubing of any thickness. If the expectations of the process are commercially realized, a new product of special properties may be expected.

Besides the centrifugal casting of steel and the notable DeLavaud cast iron pipe process, which reached commercial proportions in Canada, South America and Europe some time ago, and which has recently been adopted by a leading American pipe maker, there have been other important developments. The casting of brass and copper bands by a centrifugal process was described in these columns last May and the production of cast iron piston rings by a like method is familiar. The centrifugal casting of light and miscellaneous alloys has been in progress for some time, and successful results from the centrifugal casting of Monel metal and semi-steel have been recorded. A Sandusky inventor has also cast steel by this process. The recent announcement of the production of cast iron car wheels centrifugally in England recalls the American process of making cast steel wheels with a manganese rim by applying the centrifugal principle to a revolving mold.

The successful operation of any process of this nature insures a product, no matter of what composition, which is of a high grade. It is a realization of quality production in quantity, for rapid output is a marked characteristic. There is also the advantage of the elimination of sand and dirt. A minimum of machining is also required. The condition of casting and cooling tends to produce a dense casting and one whose microstructure is different from the sand-cast products. Centrifugal force is substituted for sink heads as an insurance against unsoundness.

There are still many problems connected with the development of this process in general. Among these are the proper casting temperatures and the rate of revolution of the mold or apparatus. Much valuable work has already been done on these two problems. There has also been trouble with molds, but a proper metal for these has been secured in one or two cases. In view of the progress thus far made in the art, it is probable that the centrifugal casting of metals and alloys is assured a prominent place in industry.

Aluminum's Advancing Position

A statement of the expansion in world production of aluminum, great as it has been, scarcely gives an adequate idea of the magnitude of the industry. In 10 years, or from 1911 to 1920 inclusive, the world output increased from 45,000 metric tons to 160,800 tons. The latter figure means much as to volume with a metal so light. The peak in output was 179,900 tons in 1918, when war demand was greatest. The United States still holds the commanding place it took in the early days, having been credited with over 54 per cent of the 1920 total. Twenty-five years ago, the industry was in its infancy and the metal almost a curiosity.

More and more active has been its competition with several of the older metals. A glance at the hardware dealer's shelves tells how it is vying with copper and steel enameled ware. In alloys, new and familiar, it has a large place in competition with other non-ferrous alloys and with alloy steel itself. In the building of airplanes it is a necessary raw material, and in automobile construction aluminum sheets are widely used. In the castings industry it has long been conspicuous.

Parallel to the interesting advances in uses of aluminum is the competition from Europe in the marketing of the metal. In 1920 over 38 per cent of the world's total was made by Germany, Switzerland, France, Norway, Sweden, etc. To-day imported aluminum is a factor in the American raw material market—so much so that it is a matter of concern to American smelters. Even in finished material, the market is full of German and other wares.

The interesting history of aluminum is perhaps prophetic of that of other metals, now less plentiful commercially. When aluminum was developed by an American metallurgist, it was looked upon as a curiosity, of little commercial value because of its cost. To-day magnesium, while somewhat more advanced commercially, may in the future play a role, singly or alloyed with aluminum, as commanding as that of the older metal.

Liquidation of labor in the British iron and steel industry has been rapid in the past year. Returns from 103 firms, employing 90,305 persons in October last year, show that the average weekly wages per person in that month was £3 8s. 2d. This compares with £5 8s. 0d. in September, 1920, and with £4 18s. 8d. in October of the same year. For the first eleven months of 1921, the net reduction in the weekly wages of the 239,500 employees affected by wage changes was £431,690 or £1 16s. 1d. per person. This is heavier than in any other of the seven industries compared except mining. After a severe struggle over many months, British labor is accepting the inevitable situation; the coal strike was probably an object lesson contributing to this result. The results are being reflected in rapidly increased production and exports of steel and iron.

January Steel Ingot Output Increases Over the December Rate

The Steel ingot statistics of the American Iron and Steel Institute show that 30 companies which in 1920 produced 84.20 per cent of the total, had an output in January of 1,593,482 gross tons as compared with 1,427,093 tons in December and with 1,660,001 tons in November. The increase in January over December was 166,389 tons or 11.6 per cent. The decrease in December from November was 232,908 tons or 14.03 per cent. Estimating the production of other companies on the basis of the 30 companies (though it is probable the small companies did not equal the rate of the larger ones), the total output of ingots in January was 1,892,296 tons or 75,700 tons per day, counting 25 working days for January.

In the table below, the output of Bessemer and open-hearth works is separated and the figures for 1920 by months are included:

Monthly Production of Steel Ingots by 30 Companies Which Produced About 84.20 Per Cent of Total in 1920—Gross Tons

	Open Hearth	Bessemer	All Other	Total
January, 1920...	2,242,758	714,657	10,687	2,968,102
February	2,152,106	700,151	12,867	2,865,124
March	2,487,245	795,164	16,640	3,299,049
April	2,056,336	568,952	13,017	2,638,305
May	2,251,544	615,932	15,688	2,883,164
June	2,287,273	675,954	17,463	2,980,690
July	2,135,633	653,888	13,297	2,802,818
August	2,299,645	695,003	5,784	3,000,432
September	2,300,417	693,586	5,548	2,999,551
October	2,335,863	676,634	3,485	3,015,982
November	1,961,861	673,215	3,594	2,638,670
December	1,687,162	649,617	3,586	2,340,365
Total, 1920...	26,197,843	8,112,753	121,656	34,432,252
January, 1921...	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total, 1921...	13,125,578	3,679,682	21,686	16,826,946
January, 1922...	1,260,809	331,851	822	1,593,482

The January ingot production was at a yearly rate of 23,542,500 tons, counting 311 operating days to the year. This compares with a rate in November of 23,581,886 tons and with 11,857,186 tons in July, the low point for 1921.

The increase of 166,389 tons in the ingot output of all companies reporting in January contrasts with a decrease of 10,389 tons in the January pig iron output from that of December.

Volume of Business Not Satisfactory in the Youngstown District

YOUNGSTOWN, Feb. 7.—With primary steel interests, the current situation with respect to volume of business on the books is far from satisfactory. Predictions voiced earlier in the year of a turn for the better around Feb. 1 are failing to materialize. While all interests are hopeful of betterment in February, some are frankly skeptical. Some uncertainty in regard to prices is proving a retarding influence. Sheet mill capacity in the Mahoning Valley was scheduled to the extent of 39 per cent this week, as compared with 35 per cent the previous week.

The Youngstown Sheet & Tube Co. has commenced the installation of electric drives for its sheet mill units, replacing steam and necessitating partial suspension of production for the time being. The installation now under way will provide electric driving power for eight mills. Whereas all 15 units of this interest were idle last week, seven are now rolling.

New business lacks a sustaining influence in many cases. One of the major interests, operating 10 of 12 open hearth furnaces this week, has orders for 10 days' production at the current rate. It is largely restricted in active finishing capacity, and must base future schedules upon the volume of tonnage which develops in the meantime.

In the aggregate considerable strip, sheet and light plate tonnage is moving to pressed and stamped metal interests for conversion into automobile parts. For instance, the Powell Pressed Steel Co., in Hubbard, Trumbull County, is operating its plant 22-hr. per day, principally on orders for the Durant and Rickenbacher motor cars, and in a smaller way for other motor builders. Durant production, it is stated, has attained a monthly rate of 4500 cars and is keeping a number of pressed steel interests fairly well engaged.

Sheet Prices Hold

It may be said with authority that sheet prices are holding taut, especially on black sheets, quoted at 3c. for No. 28 gage, and galvanized at 4c., base gage. New business is coming forward only in a moderate way, and is confined to small lots. A moderate buyer who has been placing carload lots with regularity states that he has done considerable shopping in an endeavor to uncover a concession on black sheets, but has been unsuccessful.

Some shipments are evidently going forward at prices below the current market, but in all cases this business is under contract negotiated before the first of the year and evidently extended. Most of such tonnage, however, it is felt, has been worked off, and the sheet market is firm at prevailing levels. Doubt is expressed in some manufacturing circles as to whether a large tonnage would develop much of a concession, if any.

Interests catering to the automobile trade continue in the best position, with respect to future commitments, though there is much to be desired in this respect. One of the smaller non-integrated producers is booked approximately eight weeks ahead, but this interest is an exception.

An idea of the current situation in the sheet market may be realized from the fact that the Brier Hill Steel Co. is operating 10 of its 28 sheet mills, starting Wednesday; the Republic Iron & Steel Co. has four of 18 engaged, while Trumbull Steel Co.'s sheet output is proportionately small.

COMING MEETINGS

February

American Boiler Manufacturers' Association. Feb. 13. One-day winter meeting. Fort Pitt Hotel, Pittsburgh. Secretary, H. N. Covell, 191 Dikeman Street, Brooklyn, N. Y.

American Institute of Mining and Metallurgical Engineers. Feb. 20-25. Spring meeting Engineering Societies Building, New York. Secretary, Frederick F. Sharpless, 29 West Thirty-ninth Street, New York.

American Association of Engineers. Feb. 22. Congress Hotel, Chicago. Secretary, C. E. Drayer, 63 West Adams Street, Chicago.

March

American Society for Steel Treating. March 3. Sectional meeting, Hotel McAlpin, New York. Secretary, W. H. Eisenman, 4600 Prospect Avenue, Cleveland.

Refractories Manufacturers' Association. March 15, 16 and 17. Annual meeting, Chicago. Secretary, F. W. Donahoe.

April

National Metal Trades Association. April 19 and 20. Annual meeting, Hotel Astor, New York. Secretary, Louis W. Fischer, Peoples Gas Building, Chicago.

American Supply and Machinery Manufacturers' Association and Southern Supply & Machinery Dealers' Association. Joint Meeting, April 24 to 26, Birmingham. F. D. Mitchell, 233 Broadway, New York, is secretary of the American association and A. M. Smith, Smith-Courtney Co., Richmond, Va., is secretary of the Southern association.

Society of Industrial Engineers. April 26 to 28. Spring meeting, Hotel Statler, Detroit. George C. Dent, business manager, 327 S. La Salle Street, Chicago.

American Electrochemical Society. April 27 to 29. Spring meeting, Baltimore. Acting secretary, Dr. Colin G. Fink, 110 Park Avenue, New York.

IRON OUTPUT DECLINES SLIGHTLY

Eight Furnaces Blown in, Seven Blown Out

January Production 335 Tons Per Day Less Than in December

The upward swing in the pig iron production of the country, which characterized the last few months in 1921, came to a standstill in January when the output of the blast furnaces showed a slight decline from that of December. The production in January was 335 tons per day less than that in December as contrasted with an increase of 6013 tons per day in December over November. A feature of the January output is the marked increase in the production of steel-making pig iron and a sharp decrease in that of merchant pig iron. The increase in steel-making pig iron in January over December was 957 tons per day and the decrease in merchant pig iron in January from that in December was 1292 tons per day.

The production of coke and anthracite furnaces for the 31 days in January amounted to 1,638,697 gross tons or 52,861 tons per day as compared with 1,649,086 tons or 53,196 tons per day in December, also a 31-day month. The decrease in January from December was 10,389 tons or 335 tons per day.

The total number of furnaces in blast on Feb. 1 was 126 as compared with 125 on Jan. 1. At the low point in 1921, or on Aug. 1, only 69 furnaces were in blast. The capacity of the 126 furnaces in blast Feb. 1 is estimated at 53,305 tons per day as contrasted with a capaicty of 53,735 tons per day for the 125 furnaces in blast Jan. 1. In January eight furnaces were blown in and seven were blown out.

For the first time in many months spiegeleisen in any quantity was produced. Of the total output of manganese-alloys in January of 6874 tons 1230 tons was spiegeleisen and 5644 tons was ferromanganese. The last production of spiegeleisen in any quantity was 4015 tons in July, last year.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from January, 1921, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
January, 1921	62,327	15,618	77,945
February	58,060	11,127	69,187
March	42,691	8,777	51,468
April	33,854	5,914	39,768
May	33,054	6,340	39,394
June	29,444	6,050	35,494
July	23,086	4,803	27,889
August	26,037	4,743	30,780
September	27,189	5,661	32,850
October	33,365	6,850	40,215
November	37,960	9,223	47,183
December	41,173	12,023	53,196
January, 1922	42,130	10,731	52,861

The figures for daily average production, beginning with January, 1916, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920	1921	1922
Jan.	102,746	101,643	77,799	106,525	97,264	77,945	52,861
Feb.	106,456	94,473	82,835	105,006	102,720	69,187	.....
Mar.	107,667	104,882	103,648	99,685	108,900	51,468	.....
Apr.	107,592	111,165	109,607	82,607	91,327	39,768	.....
May	108,422	110,238	111,175	68,002	96,312	39,394	.....
June	107,053	109,002	110,793	70,495	101,451	35,494	.....
July	104,017	107,820	110,354	78,340	98,931	27,889	.....
Aug.	103,346	104,772	109,341	88,496	101,529	30,780	.....
Sept.	106,745	104,465	113,942	82,932	104,310	32,850	.....
Oct.	113,189	106,550	112,482	60,115	106,212	40,215	.....
Nov.	110,394	106,859	111,802	79,745	97,830	47,183	.....
Dec.	102,537	92,997	110,762	84,944	87,222	53,196	.....

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1920	1921	1922	1920	1921	1922
Jan.	2,232,455	1,932,159	1,306,045	23,957	22,228	6,874
Feb.	2,181,679	1,625,695	.....	28,038	29,013	.....
Mar.	2,480,668	1,323,443	.....	35,275	41,294	.....
Apr.	1,968,542	1,015,621	.....	27,628	24,310	.....
May	1,128,720	1,024,678	.....	33,407	9,232	.....
June	2,209,770	883,312	.....	34,751	4,536	.....
July	2,230,567	715,664	.....	36,789	5,524	.....
Aug.	2,254,943	807,144	.....	36,985	3,878	.....
Sept.	2,247,250	815,692	.....	39,546	3,289	.....
Oct.	2,393,644	1,034,312	.....	34,786	3,902	.....
Nov.	2,150,075	1,138,789	.....	26,944	3,525	.....
Dec.	2,047,167	1,276,381	.....	28,023	3,953	.....

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for January, and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	January (31 days)	December (31 days)	November (30 days)	October (31 days)
New York	110,867	126,734	91,535	65,502
New Jersey	4,642	5,026	4,525	4,745
Lehigh Valley	31,296	31,388	30,020	27,614
Schuylkill Valley	42,144	41,450	35,850	28,176
Lower Susquehanna and Lebanon Valleys	28,227	26,106	19,356	20,581
Pittsburgh district	382,407	390,908	357,851	295,741
Shenango Valley	54,234	52,793	50,555	35,420
Western Penna.	45,511	56,593	67,432	61,742
Maryland, Virginia and Kentucky	22,858	18,917	14,754	15,827
Wheeling district	75,576	72,660	44,966	36,520
Mahoning Valley	190,436	188,391	165,562	157,512
Central and Northern Ohio	161,160	167,307	156,767	140,914
Southern Ohio	31,892	15,534	13,893	14,485
Illinois and Indiana	287,313	299,186	252,566	229,009
Mich., Minn., Mo., Wis. and Colo.	48,236	37,149	20,059	11,940
Alabama	121,073	117,886	108,125	99,948
Tennessee	825	1,064	1,665	990
Total	1,638,697	1,640,997	1,415,481	1,246,676

Capacities in Blast Feb. 1

The following table shows the number of furnaces in blast Feb. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Jan. 1:

Coke and Anthracite Furnaces in Blast

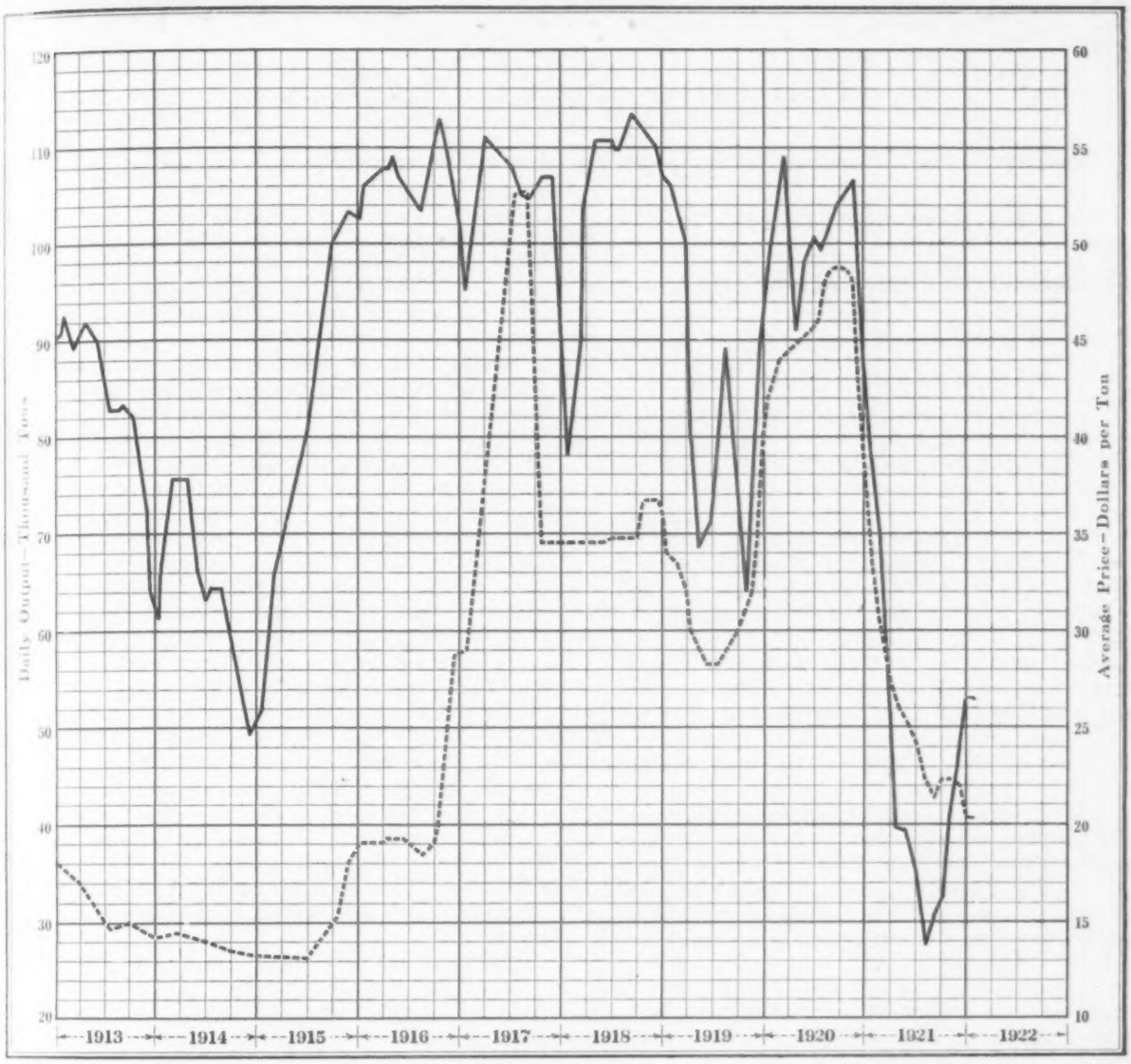
Location of Furnaces	Total Stacks	Feb. 1 In Blast	Feb. 1 Capacity per Day	Jan. 1 In Blast	Jan. 1 Capacity per Day
New York:					
Buffalo	22	8	3,300	9	3,850
Other New York	4	1	220	1	240
New Jersey	4	1	150	1	160
Pennsylvania:					
Lehigh Valley	18	4	1,010	4	1,010
Spiegel	2	0	.....	0	.....
Schuylkill Valley	15	4	1,360	4	1,400
Lower Susquehanna	10	1	400	1	400
Lebanon Valley	8	2	430	2	400
Ferro and spiegel	2	1	80	1	100
Pittsburgh District	55	27	12,500	26	12,000
Ferro and spiegel	4	1	140	1	120
Shenango Valley	19	5	2,230	4	1,750
West. Pennsylvania	26	4	1,465	5	1,845
Maryland	6	1	435	1	350
Wheeling District	15	5	2,430	5	2,340
Ohio:					
Mahoning Valley	28	13	6,330	12	6,075
Central and Northern	26	12	5,250	11	5,400
Southern	16	3	1,020	2	500
Illinois and Indiana	42	17	9,270	18	9,960
Mich., Wis. and Minn.	11	2	540	3	1,140
Colorado and Missouri	6	2	800	1	255
The South:					
Virginia	16	0	.....	0	.....
Kentucky	7	1	300	1	255
Alabama	41	10	3,615	11	4,150
Tenn., Ga. and Texas	16	1	30	1	35
Total	419	126	53,305	125	53,735

Furnaces blown in during January were the following:

No. 4 Aliquippa and No. 6 Eliza furnaces of the Jones & Laughlin Steel Co. in the Pittsburgh district; No. 4 Newcastle furnace of the Carnegie Steel Co. in the Shenango Valley; the new Trumbull-Cliffs furnace in the Mahoning Valley; the furnace of the Upson Nut Co. in northern Ohio; the Portsmouth and Sarah furnaces in southern Ohio, and one furnace of the Colorado Fuel & Iron Co. in Colorado.

Among the furnaces blown out or banked were the following:

No. 2 furnace of the Donner Steel Co. in the Buffalo district; one Monessen furnace of the Pittsburgh Steel Co. in the Pittsburgh district; the Adrian furnace in western Pennsylvania; the Jisco furnace in southern Ohio; one Gary furnace in Indiana; one Detroit furnace, A. in Michigan.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia.

and one Woodward furnace of the Woodward Iron Co. in Alabama.

Of the furnaces blown in, one was a Steel Corporation furnace and seven were independent steel furnaces. Of those blown out or banked one was a Steel Corporation furnace, two were independent steel company furnaces and four were merchant furnaces.

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1918—Gross Tons

	1918	1919	1920	1921	1922
Jan.	2,411,768	3,302,260	3,015,181	2,416,292	1,638,697
Feb.	2,319,299	2,940,168	2,978,879	1,937,257	.....
Mar.	3,213,091	3,090,243	3,375,907	1,595,522	.....
Apr.	3,288,211	2,478,218	2,739,797	1,193,041	.....
May	3,446,412	2,108,056	2,985,682	1,221,221	.....
June	3,323,791	2,114,863	3,043,540	1,064,833	.....
July	3,420,988	2,428,541	3,067,043	864,555	.....
Aug.	3,389,585	2,743,388	3,147,402	954,193	.....
Sept.	3,418,270	2,487,965	3,129,323	985,529	.....
Oct.	3,486,941	1,863,558	3,292,597	1,246,676	.....
Nov.	3,354,074	2,392,350	2,934,908	1,415,481	.....
Dec.	3,433,617	2,633,268	2,703,855	1,649,086	.....
Total	*38,506,047	30,582,878	36,414,114	16,543,686	.....

*These totals do not include charcoal pig iron. The 1920 production of this iron was 323,396 tons.

Awards in Forgings and Castings

WASHINGTON, Feb. 7.—Awards have been made by the War Department on approximately 2,419,682 lb. of aeronautical motor forgings, castings, etc., at Long Island City, on bids opened Jan. 16, as follows:

General Aluminum & Brass Mfg. Co., Detroit, 402,054 lb. scrap aluminum, at $0.12859 per lb.; McGrath Iron Co., Inc., Brooklyn, 1,257,639 lb. (561.44 gross tons) scrap iron, $13.44 per gross ton; and H. Jaffre, 220 Broadway, New York, 747,795 lb. scrap bronze, $0.105675 per lb., and 13,194 lb. scrap brass, $0.085675 per lb.

The prices were for material "as is" and "where is," loading to be done by and at the expense of the purchasers. In the aggregate these prices are slightly higher than those offered on informal bids for the same material several weeks ago.

Furnace Will Use Black Sand

SEATTLE, Feb. 1.—Black sand found on the Pacific Ocean beach near Westport, Grays Harbor, southwestern Washington, will be shipped to the furnace at Tacoma, Wash., for making iron according to C. W. Atkins of Aberdeen, Wash., who says that the furnace has placed an order with him for 4000 tons as a beginning. It is stated that the furnace, which can heat the sand to 5000 degrees Fahr., will produce a good quality of iron. The first shipment will be made about March 1. Tests have been made covering a period of several years but no furnace in the Northwest was able to produce sufficient heat to make the project of commercial value.

Iron and Steel Markets

MARKET BROADENING

More Buyers; Little Increase in Tonnage

Railroad Purchases Conspicuous — Improvement in Exports—Lower Prices

A broadening demand, though without appreciably increasing tonnage and still largely for replenishment, has marked the week. With it has come a crystallization of prices on heavy tonnage products. Consumers may now buy bars, plates and shapes in smaller lots at 1.40c., Pittsburgh, than they could a week ago. Higher prices obtain on orders in which delivery is a prime factor.

Railroad buying has now taken the stage. The Burlington has bought 6800 cars, involving 85,000 tons of steel, the largest order of the kind in many months. The road has 500 more cars to place and the St. Paul, the Norfolk & Western and other lines bring up the total of pending cars inquiries to 6800. Most of the business still remains in the West.

A large amount of passenger equipment is under negotiation, including 50 cars for the Central Railroad of New Jersey and 50 for the Baltimore & Ohio. The Union Pacific has bought 45 cars for passenger service. The Burlington will also buy 55 locomotives, the Denver & Rio Grande 20 and other roads 10.

A total of 15,500 tons of rails has been awarded, including 8500 for the Southern Railway, which, however, has postponed until the spring the purchase of 26,000 tons of 85-lb. rails. Other pending rail business approximates 50,000 tons.

Fabricated structural steel is maintaining its conspicuous place, with awards approximating 15,000 tons and fresh projects under active consideration amounting to 17,000 tons.

Mill operations have, if anything, improved. Chicago district activity is probably in excess of 50 per cent of capacity; the Steel Corporation as a whole is operating at fully 50 per cent, while the East approximates 35 per cent. Pittsburgh reports a further increase in tin plate mill operations.

January production of pig iron was practically at a standstill as compared with December. The total was 1,638,697 tons, or 52,861 tons per day, as compared with 1,649,086 tons, or 53,196 tons per day in December, a decline of 10,389 tons, or 335 tons per day. An increase of 957 tons per day in the production of steel company furnaces and a decrease of 1292 tons per day from merchant furnaces as compared with the December data may tell the story of steel makers' participation in the foundry iron market.

Eight furnaces blew in last month and seven blew out. The number active on Feb. 1 was 126 with an estimated capacity of 53,305 tons per day against 125 on Jan. 1 with a daily capacity of 53,735 tons.

Steel production for January, based on the ingot statistics collected by the American Iron and Steel Institute for 30 companies, was 1,892,500 tons, or an annual rate of 23,542,500 tons compared with December's rate of 21,084,250 tons. The making of steel slumped in December while pig iron manufacture then increased; and January in steel represented a close return to the November steel rate while January in iron remained above the November iron rate.

On Southern pig iron, $15.50 is now the usual quotation, but $15 has been named and, for the first time in several years, this iron is becoming a real factor in the North, particularly in the Chicago district. A rail and river route, which will be inaugurated Feb. 15, will still further reduce the price of delivered iron from $1 to $1.50 per ton. Basic iron in the Valley has receded to $17.75, the lowest price since 1916, and malleable has declined 50 cents. In the East, there has been considerable buying by heater manufacturers, including one lot of 5000 tons by a New Jersey company.

Increased activity is noted in the export market. Following closely the 7000 tons of 100-lb. rails for South Manchuria is an inquiry for 10,000 tons of 60-lb. rails for the Imperial Government Railways of Japan. Nail business with Japan is good. American plants have difficulty at present with markets other than the Far East because of high ocean freights, particularly in competition with Europe for the heavy tonnage products. A 12,000 ton rail order for Brazil was lost to Belgium; and transportation cost is interfering with a plate order with India.

Germany has practically ceased to be a factor in international markets. What with increased ocean freights, international exchange and German export taxes, prices on some products to-day are 50 per cent higher than they were in November.

High-speed steel is weak, a 10-ton lot being bought at 65c. per lb.

THE IRON AGE composite price for pig iron is now $18.10, the lowest since September, 1916, and hardly 15 per cent above the 10-year pre-war average. The steel composite price is the lowest since December, 1915. At 2.019c. it is not quite 20 per cent above the 10-year pre-war average.

Pittsburgh

PITTSBURGH, Feb. 7.

Pittsburgh is enjoying probably the highest rate of plant operations this week than before since last fall. But as the demand is largely of a replacement or replenishment character, there is some uncertainty whether some of the capacity which has become active in the past week can be continued in operation for any considerable time. The Pittsburgh Steel Co. on Sunday night turned on the blast at one of its blast furnaces which was banked Dec. 24 and to-day started up six of its 12 open-hearth furnaces, in which no steel had been made since the holidays. The Carnegie Steel Co. is producing iron at about the rate of 50 per cent of normal capacity. This company recently put on a furnace at Newcastle, Pa., but on Sunday blew out one of this group and for this week has two of its Lucy furnaces in blast. One of the latter, however, is to be blown out for relining, probably at the end of this week. The Lucy furnaces are making ferromanganese and spiegeleisen. The Jones & Laughlin Steel Co. has seven of its 12 blast furnaces making iron and is expected to put on another at its Woodlawn, Pa., works in the near future, on ferromanganese. Of the

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 7, 1922	Jan. 31, 1922	Jan. 10, 1922	Feb. 8, 1921
No. 2X, Philadelphia‡	$21.34	$21.34	$21.34	$32.09
No. 2 Valley furnace†	19.00	19.00	19.50	28.00
No. 2, Southern, Cin'ti†	*20.00*	20.50	21.00	32.00
No. 2, Birmingham, Ala.†	*15.50*	16.00	16.50	27.50
No. 2 foundry, Chicago*	18.50	18.50	19.00	30.00
Basic, del'd, eastern Pa.	19.84	19.84	20.25	31.40
Basic, Valley furnace	*17.75*	18.00	18.25	30.00
Bessemer, Pittsburgh	21.46	21.46	21.46	33.96
Malleable, Chicago*	18.50	18.50	19.00	30.50
Malleable, Valley	*19.00*	19.50	19.50	30.00
Gray forge, Pittsburgh	20.96	20.96	20.96	28.96
L. S. charcoal, Chicago	30.50	30.50	31.50	40.50
Ferromanganese, del'd	58.35	58.35	60.00	90.00

Rails, Billets, etc., Per Gross Ton:				
O-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	28.00	28.00	28.00	43.50
O-h. billets, Pittsburgh	28.00	28.00	28.00	43.50
O-h. sheet bars, P'gh	29.00	29.00	29.00	47.00
Forging billets, base, P'gh	32.00	32.00	32.00	48.50
O-h. billets, Phila.	33.74	33.74	33.74	49.24
Wire rods, Pittsburgh	36.00	36.00	36.00	57.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.50	1.50	1.50	2.45
Light rails at mill	1.50	1.50	1.45	2.45

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.81	1.81	1.85	2.70
Iron bars, Chicago	1.60	1.60	1.60	2.68
Steel bars, Pittsburgh	*1.40*	1.50	1.50	2.15
Steel bars, Chicago	*1.55*	1.60	1.60	2.53
Steel bars, New York	*1.78*	1.83	1.88	2.53
Tank plates, Pittsburgh	1.40	1.40	1.50	2.40
Tank plates, Chicago	*1.55*	1.60	1.60	2.78
Tank plates, New York	1.78	1.78	1.83	2.78
Beams, Pittsburgh	*1.40*	1.50	1.50	2.25
Beams, Chicago	*1.55*	1.60	1.60	2.63
Beams, New York	*1.78*	1.83	1.88	2.63
Steel hoops, Pittsburgh	1.90	1.90	2.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Feb. 7, 1922 Cents	Jan. 31, 1922 Cents	Jan. 10, 1922 Cents	Feb. 8, 1921 Cents
Sheets, black, No. 28, P'gh	3.00	3.00	3.00	4.20
Sheets, galv., No. 28, P'gh	4.00	4.00	4.00	5.70
Sheets, blue an'l'd, 9 & 10	2.25	2.25	2.25	3.20
Wire nails, Pittsburgh	*2.40*	2.50	2.50	3.25
Plain wire, Pittsburgh	2.25	2.25	2.25	3.25
Barbed wire, galv., P'gh	3.15	3.15	3.15	4.10
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$7.00

Old Material, Per Gross Ton:				
Carwheels, Chicago	$15.00	$15.00	$15.50	$21.00
Carwheels, Philadelphia	16.50	16.50	16.50	25.00
Heavy steel scrap, P'gh	*13.50*	14.00	14.50	16.00
Heavy steel scrap, Phila.	13.00	12.00	11.50	14.50
Heavy steel scrap, Ch'go	11.25	11.25	11.50	15.50
No. 1 cast, Pittsburgh	16.00	16.00	16.25	23.00
No. 1 cast, Philadelphia	16.50	16.50	16.50	23.50
No. 1 cast, Ch'go (net ton)	13.00	13.00	13.00	18.00
No. 1 RR. wrot. Phila.	14.50	14.50	14.50	20.00
No. 1 RR. wrot, Ch'go (net)	10.50	10.50	10.50	13.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$4.50
Foundry coke, prompt	3.75	3.75	3.75	5.50

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	*13.50*	13.62½	13.87½	13.50
Electrolytic copper, refinery	*13.25*	13.37½	13.62½	13.00
Zinc, St. Louis	4.50	4.50	4.77½	5.00
Zinc, New York	4.85	4.85	5.12½	5.50
Lead, St. Louis	4.40	4.40	4.40	4.50
Lead, New York	4.70	4.70	4.70	4.75
Tin (Straits), New York	32.00	32.00	32.12½	32.50
Antimony (Asiatic), N. Y.	4.40	4.40	4.50	5.25

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Feb. 7, 1922, Finished Steel, 2.019c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel.

Jan. 31, 1922,	2.048c.
Jan. 10, 1922,	2.062c.
Feb. 8, 1921,	2.943c.
10-year pre-war average,	1.684c.

Composite Price, Feb. 7, 1922, Pig Iron, $18.10 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Jan. 31, 1922,	$18.31
Jan. 10, 1922,	18.60
Feb. 8, 1921,	29.92
10-year pre-war average,	15.72

140 blast furnaces in the district bounded by Johnstown, Pa., and Wheeling, W. Va., and Warren, Ohio, there are 55 now in blast. The numerical percentage is close to 40 per cent and it is the highest rate attained in about a year. Among finishing mills the highest rate of operation still is in tin plate plants, among which the number of active units has been increased by the starting of one more mill of the Washington Tin Plate Co., and a partial resumption at the Yorkville, Ohio, works of Wheeling Steel Corporation. Other classes of finishing mills at least are holding their own with last week.

Prices still reflect considerable instability, the only important exception being sheets, on which a majority of makers are holding firmly to the 3c. base for black and 4c. base for galvanized on new rollings. On sizable tonnages of plates, shapes and bars the market is 1.40c., and large buyers of nails are being accommodated at $2.40 base per keg. This base on plates, shapes and bars is from 1c. per 100 lb. in the case of bars to 8c. per 100 lb. on structural beams and plates below the 10-year average prices of THE IRON AGE from 1905 to 1914 inclusive. The only important transaction in sheet bars the past week indicates that the market is not above $29, Pittsburgh, on this material.

A direct sale of basic pig iron from a producer to a consumer has established $17.75, Valley furnace, as the market on that grade. Scrap prices are drifting lower under smaller demand. Coal prices are slightly steadier as a result of purchases in anticipation of a strike of the miners on April 1.

Pig Iron.—The sole feature of the past week has been the sale of 1000 tons of basic iron to a Pittsburgh district sheet maker by a Valley steel works at $17.75, Valley furnace, and since the transaction was a direct one and did not involve resale iron, the sale establishes that price as the market. This price represents a decline of 25c. a ton and is the lowest price touched since November, 1915. The same buyer is reported to have also purchased 500 tons of resale iron slightly under that price. Malleable grade also is weaker, some recent transactions having been done at $19, Valley furnace. Practically nothing has been done lately in foundry or Bessemer iron, prices of which are nominally

unchanged. Prices of all grades of iron are liquidating values and have no relation to costs.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$17.75
Bessemer	19.50
Gray forge	19.00
No. 2 foundry	19.00
No. 3 foundry	$18.75 to 19.00
Malleable	19.00

Ferroalloys.—Aside from the fact that at least two makers of 50 per cent ferrosilicon have shut down their furnaces and temporarily are out of the market, the situation in ferroalloys shows no important change. The minimum asking price on this material now is $58, furnace, freight allowed, with some makers asking $60. Since the last business done was $55, the market would appear to be quotable from $55 to $60. There have been no important transactions in ferromanganese in the week under review. All makers, including the Carnegie Steel Co., are quoting 80 per cent material at $58.35 Atlantic Seaboard, or $63.67 delivered Pittsburgh common freight points. We note a sale of 200 tons of 16 to 19 per cent spiegeleisen to a Valley consumer at around $30 delivered. Interest in this material is not particularly large.

We quote 78 to 82 per cent ferromanganese, $58.35 c.i.f. Atlantic seaboard for domestic, English and German. Average 20 per cent spiegeleisen, nominal at $30 to $32 delivered Pittsburgh or Valleys; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $38.50; 11 per cent, $41.80; 12 per cent, $45.10; 13 per cent, $49.10; 14 per cent, $54.10; silvery iron, 6 per cent, $27; 7 per cent, $28; 8 per cent, $29.50; 9 per cent, $31.50; 10 per cent, $33.50; 11 per cent, $36; 12 per cent, $38.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—The market is still inactive and prices largely are nominal. A Pittsburgh district maker of strip steel is seeking from 1500 to 2000 tons of 1½-in. to 2½-in. billets, but interest in billets generally is pretty small and this also is true of slabs. Non-integrated makers of tin plate are specifying fairly well against contracts for sheet bars, but the only important sale to sheet makers recently was one of 1000 tons which was placed at $29 Pittsburgh. The Pittsburgh Steel Co. today started up six open hearth furnaces, after a shutdown of about six weeks.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $28 to $29; 2 x 2 in. billets, $29 to $30; Bessemer and open-hearth sheet bars, $30; slabs, $29 to $30; forging billets, ordinary carbons, $32 to $33, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—Demands from domestic consumers are neither large nor numerous, but there is a comparatively good export demand. On domestic business the market is quotable from $36 to $37, Pittsburgh or Youngstown, on the base size of common soft rods, while most of the export orders are at around $35, Pittsburgh. Prices are given on page 445.

Steel Skelp.—There is only a moderate demand and while makers generally are quoting 1.50c. for pipe skelp, the fact that large tonnages of plates can be placed as low as 1.40c. gives basis for a belief that large tonnages of skelp might be placed at the same figure.

Wire Products.—Orders and specifications have been considerably better so far this month than they were in the same period last month, but no one claims that they are as large as they should be, in view of the fact that distributors in practically all parts of the country are going along with very small stocks. The explanation undoubtedly is to be found in the uncertainty over prices, both present and prospective. There is no question that large buyers are able to obtain nails at $2.40 base per keg, and plain wire at a corresponding reduction from the official quotation. Small buyers are trying to place business at these prices and it is because manufacturers are refusing that orders are not heavier.

We quote wire nails at $2.50 base per keg, Pittsburgh, and bright basic and Bessemer wire at $2.25 base per 100 lb., Pittsburgh.

Steel Rails.—Business in standard rails is not especially satisfactory, for in spite of the fact that the railroads tributary to Pittsburgh, have specified against February, March and April shipments they also are seeking to have payments begin about six months hence. Makers of light rails still are holding to 1.50c. base for 25-lb. to 45-lb. sections, rolled from new steel, but are not making many sales because of competition from those rerolling old standard rails.

We quote 25 to 45-lb. sections, rolled from new steel, 1.50c. base; rolled from old rails, 1.45c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Bars.—The effort of all makers of steel bars is to maintain a base of 1.50c. and on small lots this price is obtainable, but on fairly sizable tonnages as low as 1.40c. has been done, and this may be regarded as the price to large buyers. Replacement orders are more numerous than they have been recently, but only a few really large tonnages are coming out. There is only a moderate demand for iron bars and prices are largely untested.

We quote steel bars rolled from billets at 1.40c. to 1.50c.; reinforcing bars, rolled from billets, 1.40c. to 1.50c. base; reinforcing bars, rolled from old rails, 1.35c. to 1.40c.; refined iron bars, 2c. to 2.10c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—Very little business of other than small tonnages is coming to fabricating shops in this district. There is some encouragement, however, in the fact that the inquiry is good, one company here in the past week having had no less than 40 requests for prices. Among the inquiries were some which have been dormant for some time, this indicating that investors still have the intention of some time going ahead with the projects. Plain material demands are few and generally small, and the common quotation of Pittsburgh mills still is 1.50c. for structural beams. However, business has been done in competitive territory at 1.40c. on fairly large lots, and the market is quotable from 1.40c. to 1.50c., according to the tonnage involved. Prices are given on page 445.

Plates.—Makers in this and nearby districts still are quoting 1.50c., Pittsburgh, but admit that only small lots can be sold at that figure and that 1.40c. has been done on attractive tonnages. Few of the latter are developing in this district, because not much business is coming to railroad equipment manufacturers here, and tank and barge builders lately have not been getting many orders.

Sheets.—Demand still reflects considerable caution among buyers, who show a continued disposition to take on only such tonnages as are actually required and to accompany the order with the shipping instructions. Demand is strictly on a replacement basis and while orders are greater in number than they were recently, they do not increase much in size and it still takes time to accumulate enough business to formulate a rolling schedule. The leading interest in proportion to its productive capacity, is faring better in current business than the independents. There are occasional deviations, but as a general proposition the market is rather well established at 3c. base for black and 4c. base for galvanized sheets, on new rollings. Concessions on wasters from regular quotations are much less than usual, due to the fact that the comparatively low operations of the mills prevent much of an accumulation of this class of material, while the demand for it is rather good. Prices are given on page 445.

We quote sheared plates, ¼ in. and heavier, tank quality, at 1.50c. f.o.b. Pittsburgh.

Iron and Steel Pipe.—There is a fairly steady demand for standard pipe in both steel and wrought iron from jobbers for replenishment of stocks, but there is no advance buying and a portion of current production is being stocked. Several line pipe inquiries are pending, but the possibility of an early drop in oil prices is hindering the closing of this business and also is restricting the demand for oil country pipe. Observance of the discounts is not especially rigid. Discounts are given on page 445.

Boiler Tubes.—Demand is entirely of a replacement character, with few, if any, sizable orders coming out. Charcoal iron tubes are firmly held, but prices of steel tubes, especially seamless, are very much in buyers' favor. Card discounts are given on page 445.

Hot-Rolled and Cold-Rolled Strips.—Deviations from

the established price of 3.50c., base, for cold-rolled strips are few and unimportant, but on hot-rolled strips, on account of competition from sheets, plates and skelp, the regular quotation 2c., base, Pittsburgh, is merely an asking price and the bulk of the business is being placed at from 1.85c. to 1.90c. Business in both kinds of material has been rather good during the past few weeks, but represents largely the restoration of inventories which were allowed to drop pretty low over the end of last year and the first three weeks of this year.

Tin Plate.—Specifications not only are coming along well, but almost all consuming industries are represented in them. There is unusually full occupation of tin plate capacity in this and nearby districts, and the indications point to a further increase since the Washington Tin Plate Co. has succeeded in getting going on an open shop basis, and the Wheeling Steel Corporation this week is making an effort to start up some of its mills at Yorkville, Ohio, which have been idle since last June, as a result of the refusal of that interest to renew its agreement with the Amalgamated Association of Iron, Steel and Tin Workers. The Yorkville plant is being started on an open shop basis. Observance of $4.75 per base box, Pittsburgh, for standard coke tin plate is a little more general than it was a few weeks ago.

We quote standard production coke tin plate $4.75 per base box f.o.b. Pittsburgh for carload lots.

Cold-Finished Steel Bars and Shafting.—Reports about business conditions are somewhat irregular, but the experience of most makers is that buyers are merely rounding out existing stocks, and that there is no very pronounced tendency to anticipate requirements. On the other hand, one maker in this district so far this year has had orders which amount to about one-third of the total business done during 1921. The market still is quotable at 1.90c. to 2c. base, but the lower figure is on desirable tonnages and most of those now coming out cannot thus be classified. Ground shafting is unchanged at 2.25c. base, f.o.b. mill, for carload lots.

Hoops and Bands.—The market in both products is extremely limited and hardly enough is going on to definitely establish prices. The quotable range on hoops is 1.90c. to 2c. base, Pittsburgh, but the higher figure is more of an asking than a selling basis. On bands, prices anywhere from 1.75c. to 1.90c. base are heard.

Nuts and Bolts.—Demands upon makers in this district possibly are more numerous than they were recently, but individually and in the aggregate bookings are small and business pretty much localized as a result of the fact that makers in other districts are not adhering strictly to a Pittsburgh base. The New York Central Lines will open bids Feb 8 on from 5000 to 8000 kegs of track bolts. Discounts are given on page 445.

Rivets.—Makers in this district still are holding heavy rivets at $2.25 to $2.35, base per 100-lb. Pittsburgh, but business at these prices is confined closely to this immediate territory, for Chicago makers are quoting $1 per ton less, f.o.b. Chicago, and this, together with the heavy freight, keeps local makers out of the Chicago territory. On the other hand, Chicago producers are not coming East at the prices they quote. Business still leaves much to be desired, for while orders are numerous enough, they are small individually and the lack of volume is discouraging. Prices and discounts are given on page 445.

Spikes.—The New York Central Lines will open bids Feb. 8 on 40,000 to 50,000 kegs. This being an exceptionally attractive order, the common impression is that it will bring out lower prices than lately have prevailed. The market now is quoted at $2.15 to $2.20 base per 100-lb. for standard spikes, but this order is expected to be placed at below the lower figure. Interest in small spikes is slight. Prices are given on page 445.

Old Material—The trend of prices is down because there is almost no demand from melters and dealers are taking on tonnages pretty sparingly since most of them are well up with their obligations and the possibility of a slow turnover, as well as lower prices, checks purchases for throwing down on the yards. Rather high prices were paid for scrap offered by the railroads this month, a dealer paying $14.56 per gross ton, Pittsburgh, for the heavy melting steel of the Pennsylvania Railroad, Central Region. The buyer is delivering this material against a contract taken some time ago at about $13.50, Pittsburgh. Such buying constitutes the sole support of prices. On open market transactions in heavy melting steel, $14 has become the maximum price and the more common bid is $13.50. Users of turnings are less anxious for supplies and prices are down about 50c. a ton. The market also is weaker on borings. Prices are nominal on low phosphorus steel scrap.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$13.50 to $14.00
No. 1 case, cupola size	16.00 to 16.50
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	15.00 to 15.50
Compressed sheet steel	11.75 to 12.00
Bundled sheets, sides and ends	10.50 to 11.00
Railroad knuckles and couplers	14.00 to 14.50
Railroad coil and leaf springs	14.00 to 14.50
Low phosphorus standard bloom and billet ends	17.50 to 18.00
Low phosphorus plates and other grades	17.00 to 17.50
Railroad malleable	12.50 to 13.00
Iron car axles	23.00 to 24.00
Locomotive axles, steel	21.00 to 22.00
Steel car axles	15.00 to 15.50
Cast iron wheels	15.00 to 15.50
Rolled steel wheels	14.50 to 15.00
Machine shop turnings	9.50 to 10.00
Sheet bar crop ends	13.50 to 14.00
Heavy steel axle turnings	11.00 to 11.50
Short shoveling turnings	11.00 to 11.50
Heavy breakable cast	14.50 to 15.00
Stove plate	12.50 to 13.00
Cast iron borings	11.25 to 11.75
No. 1 railroad wrought	11.50 to 12.00

Pittsburgh Rumors About Three Company Merger

PITTSBURGH, Feb. 2.—The story is current here that completion of the merger of the Youngstown Sheet & Tube Co., the Inland Steel Co. and the Steel & Tube Co. of America has been delayed because it has been discovered that the combination would not have sufficient ore lands to be fully self-contained for more than a short period. To correct this condition an effort is said to have been made to bring the Brier Hill Steel Co., Youngstown, which has a controlling interest in the Biwabik and Pennington Mining Co. into the merger. It is also intimated that negotiations have been started for the acquisition of some of the Breitung ore properties. Beside the matter of ore reserves, a desire to include a Pittsburgh district plant in the combination also is said to have hindered completion of the deal. In this connection, is a report that the Midland, Pa., plant of the Crucible Steel Co. of America is being considered. This plant has two modern 600-ton blast furnaces, a by-product coke plant comprising 100 Koppers ovens, 10 basic and two acid open-hearth furnaces, blooming, billet and bar mills and is essentially a soft steel plant, although built to provide steel for the other Pittsburgh district mills of the Crucible company, the principal business of which is tool and special steels.

The W. & B. Douglas Co., Middletown, Conn., pumps, has increased its operating schedule to four days a week in the foundry, and to five days in most other departments. The company is shipping goods as far west as California, and is doing an excellent business in Cuba and Europe.

The Four-Cylinder Car Division, Nash Motors Co., Milwaukee, on Feb. 1 resumed an 8-hour day in all departments, affecting about 400 employees who for some time have been working mornings only. B. W. Twyman is general manager.

Chicago

CHICAGO, Feb. 7.

The placing of 6800 freight cars by the Burlington is the feature of the week. This is the largest car order placed in years and will mean an addition of 85,000 tons of steel to mill books. Other good-sized railroad orders are in immediate prospect; in fact, current car purchases are exceeding the maximum expectations of the steel trade. Concomitant with better railroad buying is a steady expansion in general demand for rolled steel. Jobbers are commencing to lay in stocks and miscellaneous manufacturers from all sections of the West are placing small orders. In the building field also, there are signs of quickening activity, although obstructive union tactics are proving a hindrance here and there, notably in Chicago.

While business is improving, prices are settling to a new level, 1.55c. to 1.60c., Chicago, being commonly quoted on plates, shapes and bars, while attractive tonnages are being placed for less. Bolt and nut discounts, which have long been weak and ill-defined, are now on an f.o.b. factory basis except for products which are not made in quantity in Western plants.

In the pig iron market Southern competition is becoming a real factor, a recession in price to $15, Birmingham, coupled with river and rail rates, having brought delivered prices practically to a parity with those from Chicago furnaces at numerous points in this vicinity.

The Inland Steel Co.'s operations have shown further improvement, steel output being on a 50 per cent basis. The Illinois Steel Co. is running at the same rate as a week ago, while the Interstate Iron & Steel Co. is operating at better than 50 per cent at its steel plant and merchant mill.

Ferroalloys.—A large local consumer has purchased 100 tons of ferromanganese at the market. A railroad equipment manufacturer is inquiring for 250 tons. An inquiry for one car of spiegeleisen is current.

We quote 78 to 82 per cent ferromanganese, $66.75, delivered; 50 per cent ferrosilicon, $56 to $57.50, delivered; spiegeleisen, 18 to 22 per cent, $36.50 to $37, delivered.

Pig Iron.—For the first time in several years, Southern iron is getting on a competitive basis with the Northern product in this territory. Southern foundry has been sold at as low as $15, base Birmingham, or the equivalent in terms of f.o.b. furnace, and the all-rail rate brings the delivered price in Chicago to $21.67. While this is about $2.50 above the delivered price in Chicago for local iron, there are certain points in Chicago territory where the advantage is in favor of the South. Southern competition will be accentuated on Feb. 15, when combination rail and water rates will further reduce the delivered prices of the Southern product by from $1 to $1.50 a ton. The iron will be hauled by barge down the Tennessee River to Metropolis, Ill., where it will be transferred to a railroad. Each barge will hold 400 tons and a single steamer will tow from three to four barges from the furnace to Metropolis in 40 hours. Northern merchant furnaces continue to pile some iron, but report that shipments are steadily increasing in volume. While current orders and inquiries are individually small, ranging from a carload to 200 or 300 tons, interest in the market is more general than it has been since last fall. The Chicago, Milwaukee & St. Paul is inquiring for 600 tons of malleable and 100 tons of foundry for prompt delivery, and the New York Central wants eight cars of No. 2 foundry and three cars of charcoal for early shipment to its Elkhart, Ind., shops.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$30.50 to $31.50
Northern coke, No. 1, sil. 2.25 to 2.75	18.50 to 19.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	18.50
Northern high phos	18.50
Southern foundry, sil. 1.75 to 2.25	21.67
Malleable, not over 2.25 sil	18.50
Basic	18.50
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	29.50
Silvery, sil. 8 per cent	32.82 to 34.82

Railroad Equipment.—The Chicago, Burlington & Quincy has placed orders for 6800 freight cars and still has 500 to place, being undecided as to whether they will be automobile or box cars. The distribution of the orders is as follows: Western Steel Car & Foundry Co., 1000 composite gondola cars; American Car & Foundry Co., 500 refrigerator cars, 500 stock cars and 500 composite gondola cars; Pullman Co., 500 composite gondola cars, 500 box cars and 400 refrigerator cars; Mount Vernon Car Manufacturing Co., 1000 box cars; General American Car Co., 500 box and 400 refrigerator cars; Bettendorf Co., 1000 all steel gondola cars. The Burlington will also soon place orders for 55 locomotives. The Union Pacific has ordered 25 baggage cars from the American Car & Foundry Co. and 20 coaches from the Pullman Co. The Chicago, Milwaukee & St. Paul is inquiring for 1000 box cars. The Pacific Fruit Express is expected to close for 3300 refrigerator cars during the current week. The Baltimore & Ohio is in the market for 50 passenger service cars. The Norfolk & Western is inquiring for 1000 gondola and 1000 hopper cars and also contemplates the purchase of power. The Denver & Rio Grande is in the market for 20 Pacific type engines, while the Norfolk Southern and the Kentucky & Indiana Terminal are asking for prices on five locomotives each. The New York, Ontario & Western has ordered four mountain type engines from the American Locomotive Co.

Bars.—Demand for soft steel bars continues to show gradual improvement. Not only are further specifications coming from car builders, but jobbers and miscellaneous manufacturers are commencing to replenish their stocks. Even the farm implement makers who have been practically idle for a year, are buying in a small way. In the reinforcing field, building construction is expanding and a round tonnage for spring road building has been placed. On Feb. 3 the Milwaukee Sewerage Commission opened bids on 5000 tons of reinforcing bars for the Jones Island sewage disposal plant. The Inland Steel Co. was low bidder with a figure of $31.90 delivered on soft steel bars and will undoubtedly get the order, although a formal award will not be made until later this week. This bid is said to be equivalent to 1.475c., f.o.b. mill, after deducting freight and extras. Other bidders f.o.b. Milwaukee were: Corrugated Bar Co., $32.95 for new steel; Concrete Steel Co., $33.30 for new steel; Calumet Steel Co., $29.24 for re-rolled steel; Inland Steel Co., $29.90 for re-rolled steel; Paul J. Kalman Co., $34 for new steel; Donner Steel Co., $36.90 for new steel. The Kansas City Bolt & Nut Co. has closed a contract with the Kansas City Stockyards Co. to furnish 670 tons of soft steel deformed reinforcing bars for the construction of the American Royal Exposition Building. Soft steel bars are commonly quoted at from 1.55c. to 1.60c., Chicago, while attractive tonnages are moving at concessions of $1 to $2 a ton.

Mill prices are: Mild steel bars, 1.55c. to 1.60c., Chicago; common bar iron, 1.60c., Chicago; rail carbon, 1.50c., mill or Chicago.

Jobbers quote 2.53c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 1.90c. base. Hoops and bands, 3.13c.

Wire Products.—Demand is not so brisk as in recent weeks and more is heard of price concessions, although it cannot be said that the market has developed marked weakness. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, Page 445.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.13 per 100 lb.; No. 9 and heavier bright basic wire, $3.28 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.65 per keg.

Sheets.—Notwithstanding reports of isolated concessions on galvanized in other sections of the country, the local market on sheets appears to be firm in all departments. Domestic business is commencing to revive and this, added to a good export backlog, has put the local independent mill in a comfortable position.

Mill quotations are 3c. for No. 28 black, 2.25c. for No. 10 blue annealed and 4c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 3.38c.; No. 28 black, 4.15c.; No. 28 galvanized, 5.15c.

Steel Castings.—Current and prospective business is largely in steel castings required for railroad cars

and locomotives. The importance of railroad orders may be grasped when it is realized that there are 40 tons of steel castings in the average locomotive and two and one-half in the average freight car. The freight car order just placed by the Burlington will result in the placing of fully 15,000 tons of steel castings. The list price and discounts on page 348-350 of THE IRON AGE of Feb. 9, indicate the current market.

Plates.—Local mills report a further increase in the volume of business. Heavy specifications continue to be received from car builders, one company having sent in rolling instructions on 10,000 tons of plates, shapes and bars within the past week. The placing of the Burlington freight cars will result in the placing of fully 85,000 tons on mill books. Other good sized car orders are in immediate prospect, so that steel producers are assured a steady stream of tonnage business for some time. Steel buying is not confined to the car shops. Jobbers are commencing to replenish their stocks, one local warehouse having placed an order for 6000 tons of plates, shapes and bars, and small manufacturers also are placing orders to take care of their immediate needs. Demand is more widely distributed than for some time and while the trade is cautious about jumping to conclusions, it is swinging to the belief that real progress towards industrial revival is being made. Prices are softening concurrently with the increase in mill bookings. from 1.55c. to 1.60c., Chicago, is commonly quoted, while attractive lots are moving at 1.50c. and less. In fact, heavy tonnages of desirable specifications have been bought by car builders at as low as 1.45c. and 1.40c. The making of sharp concessions to secure large tonnages has been a characteristic of the market ever since the present depression set in and is accounted for by the desire of mills to avoid interruptions in operations which might prove necessary if they were entirely dependent on the ordinary run of bookings.

The ruling mill quotations range from 1.55c. to 1.60c., Chicago. Jobbers quote 2.63c. for plates out of stock.

Structural Material.—Prospects of a settlement of the local building controversy were given another set back when the carpenters voted to insist on their demand for a wage of $1.10 an hour. This action followed the unanimous decision of the Chicago Building Trades Council to accept the Landis award. While this development has again introduced uncertainty in the local building situation, prospects for construction activity in other sections of the West are steadily growing brighter. The placing of 17,137 tons of the Chicago Union Station, announced in this column last week, has been followed by the largest number of fabricating awards reported for a considerable period. Plain material prices are settling to a lower level as demand increases. From 1.55c. to 1.60c., Chicago, is commonly quoted, and on large tonnage concessions of $1 to $2 under those prices have been made. Recent fabricating awards include:

Equitable Life Insurance Co. Building, Des Moines, Iowa, 3200 tons, to American Bridge Co.

Putnam Department Store Building, Davenport, Iowa, 1088 tons, to Rock Island Bridge & Iron Works.

Chicago Union Mail Terminal, conveyor and structural steel supports, 370 tons, to Pittsburgh Bridge & Iron Co.

Masonic Temple, Eureka, Cal., 150 tons, to American Bridge Co.

University of Montana, Library Building, Missoula, Mont., 104 tons, to Minneapolis Steel & Machinery Co.

Alambeau Paper Co., pulp mill, Park Falls, Wis., 110 tons, to Worden-Allen Co.

Addition to Illinois Masonic Orphanage, LaGrange, Ill., 100 tons, to Gage Structural Steel Co.

Sisters of St. Mary Hospital, St. Louis, 914 tons, reinforced concrete substituted for structural steel.

The mill quotation on plain material ranges from 1.55c. to 1.60c., Chicago. Jobbers quote 2.63c. for plain material out of warehouse.

Bolts and Nuts.—Demand is still unsatisfactory, although some buying is being done by jobbers and the railroads, and a few automobile makers are sounding the market. Ford's operations are improving, his program for February calling for 60,000 cars. Bolt and nut discounts, although still very weak, appear to be stabilizing on a new basis. F.o.b. factory prices are the rule on machine bolts, carriage bolts, lag bolts, plow bolts, hot pressed nuts and stove bolts, while on materials largely made in the East, such as machine bolts and cold-punched nuts, semi-finished hexagon nuts, cold-punched chamfered and trimmed nuts, and tire bolts, f.o.b. Pittsburgh is still quoted. The following discounts f.o.b. factory are fairly representative for less than carload orders. On carload orders an additional discount of 5 per cent or more is not unusual.

Small machine bolts, rolled threads, 70 and 10 and 10 off.; cut threads, 70 and 10 off; large machine bolts, 70 and 10 off; small carriage bolts, rolled threads, 70 and 10 off; cut threads, 70 off; large carriage bolts, 70 off; lag bolts, 70 and 10 and 5 off; hot pressed nuts, black, $5.75 off; tapped, $5.50 off; stove bolts in packages, 80 and 10 and 10 and 10 off; in the bulk, 80 and 10 and 10 and 10 and 2½ off.

Jobbers quote structural rivets, 3.43c.; boiler rivets, 3.53; machine bolts up to ⅞ x 4 in., 60, 10 and 10 per cent off; larger sizes, 60 to 10 off; carriage bolts up to ⅞ x 6 in., 60 and 10 off; larger sizes, 55 and 5 off; hot pressed nuts, square and hexagon tapped, $3.75 off; blank nuts, $4 off; coach or lag screws, gimlet points, square heads, 65 and 5 per cent off. Quantity extras are unchanged.

Cast Iron Pipe.—St. Paul has awarded 1290 tons to the National Cast Iron Pipe Co. The United States Cast Iron Pipe & Foundry Co. is low bidder on 300 tons for high pressure pipe for the Detroit Board of Fire Commissioners. Sellers are encouraged by the amount of business in prospect. Milwaukee is expected to ask for bids on about 2000 tons Feb. 20. On Feb. 3 the sewerage commission of that city let 100 tons of miscellaneous class A pipe to James B. Clow & Sons. New inquiries include:

Minneapolis, 800 tons, bids to be in Feb. 10; Muscatine, Iowa, 650 tons, Feb. 14; Greybull, Wyo., 330 tons, Feb. 13; New Ulm, Minn., 65 tons., Feb. 28.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $45.60 to $46.60; 6-in. and above, $41.60 to $42.60; class A and gas pipe, $3 extra.

Coke.—The prospect of a coal strike has stimulated the demand for coke. For the first time in many months, foundries are contracting ahead, a number of contracts covering requirements for from six months to the rest of the year having been closed. Local by-product foundry is selling at $10.75 delivered Chicago switching district, while Connellsville can be bought for less.

Old Material.—Although a tendency towards weakness is reported in some quarters, consumptive buying has been too limited to establish any material changes in prices. Among the few recent transactions may be mentioned purchases of 2000 or 3000 tons of malleable by two local foundries at $13 per gross ton delivered, and purchases by an iron mill of 500 tons of No. 2 wrought at $10 per net ton delivered and approximately 250 tons of No. 1 busheling at $8.25 per net ton delivered. Railroad lists include the Pennsylvania South-Western Region, 5000 tons; the Union Pacific, 2500 tons; the Pere Marquette, 2000 tons; the Pullman Co., 1000 tons; the Chicago & Eastern Illinois, 900 tons; and the Erie, a blind list.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$16.00 to $16.50
Relaying rails	20.00 to 25.00
Cast iron car wheels	15.00 to 15.50
Rolled or forged steel car wheels	13.00 to 13.50
Steel rails, rerolling	12.00 to 12.50
Steel rails, less than 3 ft.	12.50 to 13.00
Heavy melting steel	11.25 to 11.75
Frogs, switches and guards cut apart	11.25 to 11.75
Shoveling steel	10.75 to 11.25
Low phos. heavy melting steel	13.50 to 14.00
Drop forge flashings	7.50 to 8.00
Hydraulic compressed sheet	7.50 to 8.00
Axle turnings	8.50 to 9.00
Per Net Ton	
Iron angles and splice bars	14.00 to 14.50
Steel angle bars	10.50 to 11.00
Iron arch bars and transoms	15.00 to 15.50
Iron car axles	19.50 to 20.00
Steel car axles	12.50 to 13.00
No. 1 busheling	8.25
No. 2 busheling	6.00to 6.50
Cut forge	10.00 to 10.50
Pipes and flues	6.50 to 7.00
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	11.25 to 11.75
Coil springs	12.50 to 13.00
No. 1 machinery cast	13.00 to 13.50
No. 1 railroad cast	12.50 to 13.00
Low phos. punchings	11.00 to 11.50
Locomotive tires, smooth	9.50 to 10.00
Machine shop turnings	4.50 to 5.00
Cast borings	6.00 to 6.50
Stove plate	12.00 to 12.50
Grate bars	10.50 to 11.00
Brake shoes	10.50 to 11.00
Railroad malleable	11.25 to 11.75
Agricultural malleable	11.25 to 11.75

New York

NEW YORK, Feb. 7.

Pig Iron.—The postponing of the opening of bids on the vehicular tunnel until Feb. 15 has caused considerable disappointment among the pig iron men, many of whom expected to figure with contractors on the iron for the segments. One New Jersey heater company has closed for the 5000 tons for which it was announced last week it was in the market. Another heater company has closed for from 2000 to 3000 tons. While details as to the transactions are lacking, it is known that a considerable part of the iron was purchased from nearby furnaces. It is doubtful whether any of it will come from the Buffalo district, although in that district some very low prices are being made in cases of keen competition. A New Jersey valve and fittings company is in the market for 800 tons for delivery over four months beginning with May, and a number of other inquiries are pending. There is a tendency to inquire for deliveries extending through the second quarter and sometimes into August. On the whole the market is more active and feeling more cheerful.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.02
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	22.52
Buffalo, sil. 1.75 to 2.25	24.96
No. 2 Virginia, sil. 1.75 to 2.25	28.16

Ferroalloys.—The representative of one British producer of ferromanganese has been authorized to quote the alloy at $62.50, seaboard, as compared with $58.35, which has prevailed up to this time. It is presumed that this quotation will at once become general as far as the British alloy is concerned. The market is quiet, sales being confined to carload lots. There are two fairly large inquiries before the market, one for 250 to 500 tons and another for 300 to 500 tons. The spiegeleisen market continues moderately active, with sales of 300 tons reported as well as carload lots, and with an inquiry before the market of 500 tons. There is no activity in the manganese ore market, but it is reported that an inquiry into the Russian manganese ore situation has shown that it is practically impossible to ship any quantity of high grade ore from Russia, owing to the demoralization of the railroads and the bad condition of the ports, so that not much is expected of any attempt to obtain Russian manganese ore in the near future. The 50 per cent ferrosilicon market is fairly active and contracts for delivery of 1922 have been made by a few of the large steel companies, several thousand tons being involved, the prices being those generally prevailing. There have also been sales of carload lots here and there and the interesting statement is made that 200 to 300 tons has been sold for export to England. Demand for ferrochromium is very light and quotations are largely nominal. Quotations follow:

Ferromanganese, domestic, seaboard, per ton	$58.35
Ferromanganese, British, seaboard, per ton	$62.50
Spiegeleisen, 20 per cent, furnace, per ton	$26.00
Ferrosilicon, 50 per cent, delivered, per ton	$55.00 to $60.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium per lb. of contained vanadium	$4.00
Ores	
Manganese ore, foreign, per unit, seaboard	22c. to 25c.
Tungsten ore, per unit, in 60 per cent concentrates	$2.00 up
Chrome ore, 40 to 45 per cent Cr_2O_3, crude, per net ton, Atlantic seaboard	$20.00 to $25.00
Chrome ore, 45 to 50 per cent Cr_2O_3, crude, per net ton, Atlantic seaboard	$25.00 to $27.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	50c. to 60c.

Warehouse Business.—The past week is generally conceded to mark an improvement over any week in January. Whether it is a sporadic recovery or a permanent change for the better is a question. Prices are undoubtedly weak in some quarters, and although most warehouses see no revision of quotations for the present, some believe that a change may be made in the near future. In and around New York City there is reported slight activity in structural steel for building construction and a Brooklyn warehouse with men on the road in New England reports some fair-sized purchases of No. 16 gage blue annealed sheets by New England stove manufacturers. Brass and copper prices are unchanged and business is even more active than in January, which was reported as an improvement over last year. Dealers in wrought iron and steel pipe report no change in the dullness of this market. We quote prices on page 458.

Finished Iron and Steel.—Business has broadened sufficiently to make the price on large lots of heavy tonnage products what has been regarded as the quotation for the hitherto infrequent large inquiry, namely 1.40c. Pittsburgh. In short in the lean market which has obtained, keen competition had developed prices for some time below the general quotation but these same prices have been named on the less spectacular offerings and the prices are no longer special. In the local domestic market structural steel work continues the outstanding avenue of consumption; in fact, it is estimated that 100,000 tons of work is actively being considered in the East. Noteworthy is the number of speculative undertakings. These are being consummated apparently on the basis of a belief that any freight reductions or fuel reductions will not be reflected in to-day's minimum for building materials, at least steel. Railroad car work is still conspicuously a Western matter. The Burlington has closed on 5300 cars and 2000 more for that road are pending and the Milwaukee is in the market for 1000 or more box cars. In the East a considerable number of passenger cars will be bought; the Central Railroad of New Jersey wants 50 and a lot is wanted by the Baltimore & Ohio and the Boston & Maine. The New York Central will take bids this week on 40,000 to 50,000 kegs of spikes and on a round lot of wheels. New structural steel work includes the following:

Building for Vacuum Oil Co., Olean, N. Y., 250 tons.
Loft building, West Thirty-eighth Street, 1000 tons.
Art Museum, Corning, N. Y., 500 tons.
Two loft buildings, West Thirty-seventh Street, each 1000 tons.
Apartment house, Park Avenue, 500 tons.
Columbia University, 200 tons.
Two highway bridges, Monmouth County, N. J., 500 tons.
Title Guaranty & Trust Co., Jamaica, L. I., 300 tons.

Late awards include the following:

Training school, Cortland, N. Y., 1000 tons, to Lehigh Structural Steel Co.
Crane runways, Ellison Co., Elkland, Pa., 300 tons.
Brooklyn Edison Co., 600 tons, to the Phoenix Bridge Works.
Apartment house, West Seventy-fifth Street, 600 tons, to the Harris Structural Co.
Paper mill, Spring Grove, Pa., 500 tons, to the Belmont Iron Works.
Transportation towers, to be erected in the South, 500 tons, to American Bridge Co.
Tanks for Mexican Petroleum Co., Carteret, N. J., 3500 tons, to American Bridge Co.
New York State Highway Commission, 350 tons, to the Shoemaker-Satterthwait Bridge Co.

We quote for mill shipments, New York, as follows: Soft steel bars, 1.78c. to 1.88c.; plates, 1.78c. to 1.88c.; structural shapes, 1.78c. to 1.88c.; bar iron, 1.78c. to 1.88c. On export shipments the freight rate is 28.5c. per 100 lb., instead of 38c., the domestic rate.

High Speed Steel.—Purchases in this market are, as usual, small. Consumers evidently believe that it is unnecessary to carry more than a very small quantity of steel in stock and show no inclination to recede from their position of hand-to-mouth buying. Producers generally quote 80c. to 90c. per lb. on 18 per cent tungsten high speed steel, with special brands ranging up to as high as $1.05 per lb.

Cast-Iron Pipe.—The optimism that has been felt for some time past continues. Prices are firm. In this district, two municipal lettings will be made; one on Feb. 10, for furnishing 600 tons of 8-in. to 16-in. cast-iron pipe to the New York City Department of Water Supply, Gas and Electricity; the other on Feb. 14, for about the same tonnage of 8-in. to 16-in. pipe to contractors holding municipal contracts. We quote per net ton,

f.o.b. New York, carload lots, as follows: 6-in. and larger, $47.30; 4-in. and 5-in., $52.30; 3-in., $62.30, with $4 additional for Class A and gas pipe.

Coke.—The coke market is developing considerable more activity, due largely, it is believed, to the prospect of the coal strike in the bituminous regions April 1. Many foundries are showing a disposition to accumulate stocks. Connellsville foundry coke is quoted at $3.75 to $3.50, ovens, a rather wide range, but there is little good coke available at less than $4. By-product coke is selling at $8.59 delivered New Jersey points, this being on the basis of $4.25 for Connellsville coke and $4.34 freight.

Old Material.—There is no appreciable change from last week. Buyers continue to show some activity with a strong bearish tendency. In most instances they evidently consider the present market from $1 to $1.50 per ton too high on heavy melting steel. Sellers are, however, holding rather firmly to current prices. Some activity is noted in New England, a Worcester consumer having closed with a Massachusetts seller on a small quantity of heavy melting steel. A broker with a branch office in New York has reduced his buying price on cast borings and machinery cast by 50c. per ton. Short length steel rails are off about 25c., while heavy melting steel is fairly firm at $8 to $8.50 per ton, last week's quotation.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$8.00 to $8.50
Steel rails, short lengths, or equivalent	8.25 to 8.75
Rerolling rails	9.50 to 10.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	10.00 to 10.50
Iron car axles	18.50 to 19.00
No. 1 railroad wrought	10.00 to 10.50
Wrought iron track	8.50 to 9.00
Forge fire	5.00 to 5.50
No. 1 yard wrought, long	9.00 to 9.50
Cast borings (clean)	7.00 to 7.50
Machine-shop turnings	4.00 to 4.50
Mixed borings and turnings	4.50 to 5.00
Iron and steel pipe (1 in. diam. not under 2 ft. long)	7.25 to 7.75
Stove plate	9.75 to 10.25
Locomotive grate bars	9.50 to 10.00
Malleable cast (railroad)	8.00 to 8.50
Car wheels	10.50 to 11.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$16.50 to $17.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	15.50 to 16.00
No. 1 heavy cast, not cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	10.00 to 10.50

Bids on Tunnel Postponed

Bids for construction work and materials on the Hudson River vehicular tunnel were postponed at 3.30 p. m. Feb. 7, one-half hour after the scheduled opening, in response to the plea of four contractors that they could not obtain their bonds by Feb. 7. Duplicate resolutions were passed by the New York State Bridge and Tunnel Commission and the New Jersey Interstate Bridge and Tunnel Commission, in executive session, stating that the puplic interest demanded that the opening of bids be deferred until Feb. 15, at 3.00 p. m., in the Hall of Records, New York, up until which time proposals will be accepted. The following is the resolution as passed by both commissions:

Be it resolved by the New York State Bridge and Tunnel Commission (the New Jersey Interstate Bridge and Tunnel Commission concurring) that the public interest demands that the opening of bids on Contracts Nos. 3 and 4 be and the same hereby is deferred, and that sealed bids and proposals will be received at the Office of the Commissions, Room 617, Hall of Records, New York, until Wednesday, the fifteenth day of February, 1922, at 3 o'clock p.m., Eastern standard time, at which time or at a later date to be fixed by the commissions the proposals will be publicly opened.

The Nichols-Lintern Co., Cleveland, manufacturer of the Lintern electro-magnetic sander and the well known N-L line of electric railroad car equipment, is moving into a new factory building especially designed for its requirements. The company has been active since 1913. Officers are: William Lintern, president and manager; John B. Lintern, vice president; Lewis B. Foote, secretary and treasurer.

Cleveland

CLEVELAND, Feb. 7.

Iron Ore.—The effect of the restoration of the higher rail rates on ore was shown in the movement from Lake Erie docks during January. Consumers increased their dock shipments in December in order to avoid paying the higher freight charges and the movement from the docks fell off sharply during January, dock shipments for the month being only 211,533 gross tons as compared with 597,398 tons during December. Dock shipments during January, 1921, were 723,294 tons. The dock balance Feb. 1 was 8,223,216 tons as compared with 9,217,089 tons on the same date a year ago.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $6.45; Old range non-Bessemer, 51½ per cent iron, $5.70; Mesabi Bessemer, 55 per cent iron, $6.20; Mesabi non-Bessemer, 51½ per cent iron, $5.55.

Pig Iron.—Sales during the week were rather light and soft spots have appeared in prices on foundry iron, which is the only grade that is active. A number of sales of foundry iron, including a 500 ton lot to a sanitary interest, are reported at $19 for No. 2, but some business has been booked at $18.75 or lower for shipment to competitive points and in a few cases $18.50 quotations have appeared. However, a lot of about 400 tons of iron running 1.15 to 1.60 in silicon brought $18.50. A sale of 100 tons of low silicon malleable iron is reported at $18.25. One selling agency booked 3300 tons during the week in lots of 200 tons and under. Consumers continue to follow the policy of buying in small lots. As an example, one foundry that is melting close to 1000 tons of iron per month has been for some time placing two 100-ton lot orders per week. Locally the demand has improved, several sales in lots of 200 tons and under being made during the week, all at the base price of $20 for foundry iron. Among inquiries is one from a western Pennsylvania consumer for 500 tons of foundry iron on which $18.50 is reported to have been quoted and one from an Ohio cast iron pipe foundry for an unspecified tonnage. The Allegheny Steel Co. has purchased 500 tons of additional resale basic iron which will be shipped from a nearby furnace. Southern iron has declined about 50c. to $15.50. One Alabama producer is quoting No. 2 iron at a price equivalent to $15.60 Birmingham. All producers report an improvement in shipping orders. Many foundries are busier and are taking more iron than they have been. One Cleveland foundry that specializes on automobile castings which has been melting little iron recently has released 500 tons for February shipment. M. A. Hanna & Co. will blow in their "B" furnace in Detroit this week to take the place of their "A" furnace, which had to be blown out about three weeks ago because of an accident.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 56c. switching charge. Other quotations are delivered Cleveland, being based on a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and a $6.67 rate from Birmingham:

Basic		$19.96
Northern No. 2 fdy., sil. 1.75 to 2.25	$19.00 to	20.00
Southern fdy., sil. 1.75 to 2.25	22.17 to	22.27
Ohio silvery, sil. 8 per cent		32.86
Standard low phos., Valley furnace		32.00

Bolts, Nuts and Rivets.—The interest of bolt and nut makers is centered on several thousand tons of large bolts required for the vehicular tunnel, New York, for which bids will be opened Feb. 15. Keen competition is expected to bring out some very low prices. Orders improved somewhat during the week, but buying is almost wholly in small lots. While lower prices are reported in other districts, Cleveland makers are inclined to hold to regular quotations. Rivet orders are still light. Orders that are being taken by local makers are at regular prices as they are not inclined to meet the concessions of $1 to $2 a ton that are being named by some rivet makers.

Finished Material.—Encouraging reports are coming from various metal working industries indicating an improvement in plant operations and these are reflected in some improvement in small orders for miscellaneous lots of steel. A leading Detroit automobile manufacturer during the week gave out specifications for con-

siderable tonnage for early shipment on existing contracts. An Ohio axle manufacturer is inquiring for 300 tons of bars. The demand for wire from manufacturers has improved and a fair volume of business is coming out in welded pipe and tin plate. The principal development in the price situation during the week is a little further easing off, permitting consumers to buy smaller lots of steel bars, plates and structural material at 1.40c. than they could a week ago. However, 1.50c. is still the recognized market price and small lot orders are being booked at that price. With the prevailing market weakness, consumers are buying only for immediate requirements and some are believed to be holding back small orders with the expectation of getting the 1.40c. price. Hoops are weak and the 1.90c. price on these is becoming more general. The demand for hot-rolled strip steel has improved, but the price is irregular. One strip mill has taken some business at 1.85c. Cold-rolled strip steel is still dull but firm. Little activity is developing in the building field. The Alliance Structural Co., Alliance, Ohio, has taken the bank building for the Elyria Saving & Trust Co., Elyria, Ohio, requiring 200 tons. The new plant of the Sandusky Cement Co., Cleveland, to be built at Sylvania, Ohio, will require 1500 tons of structural material. An inquiry is pending for 200 tons of reinforcing bars for a school building in Elyria. The Sinclair Oil Co. has placed additional oil tanks requiring 1500 to 2500 tons of plates. Reports have reached here that another lake boat has been placed with a Canadian shipyard. This is for a sand and gravel carrier of Welland Canal size.

Jobbers quote steel bars, 2.36c.; plates and structural shapes, 2.46c.; No. 9 galvanized wire, 3.25c.; No. 9 annealed wire, 2.75c.; No. 28 black sheets, 3.75c.; No. 28 galvanized sheets, 4.75c.; No. 10 blue annealed sheets, 3.10c.; hoops and bands, 2.96c.; cold-rolled rounds, 3.25c.; flats, squares and hexagons, 3.75c.

Sheets.—The demand continues slow. While regular prices appear to be holding well, there are reports that black sheets have been shaded $5 a ton to 2.75c. by one or two mills and there is still irregularity in the heavier gages of blue annealed sheets on which quotations of 2.10c. or possibly lower are being made for No. 10 gage. Plate mills are quoting unannealed sheets on a 1.50c. plate base, or 1.80c. for No. 10.

Tool Steel.—High speed tool steel is very weak. While small orders are being taken at 80c. to 85c. per lb. for 18 per cent tungsten steel, it is understood that an inquiry for a 10-ton lot has brought out quotations around 65c. per lb.

Coke.—The market is not as active as it has been, but there is still some demand for small lots of foundry coke. Prices are unchanged at $4 to $4.25 per ton for standard Connellsville foundry coke.

Old Material.—The market continues dull, but prices are holding fairly well. About the only activity during the week was between dealers who purchased some small lots of scrap to clean up on old orders, mostly with Youngstown mills. Some of the mills are buying small lots of scrap when offered at attractive prices. There seems to be some disposition among consumers to cut production costs by buying the cheapest grade of scrap that they can use in open-hearth furnaces. Recent buying by a Ceveland consumer has resulted in a little further stiffening of prices on blast furnace scrap, but lower than the quoted prices would have to be named for shipment from Cleveland to mills in Youngstown and other districts.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$12.00 to $12.50
Steel rails, under 3 ft.	12.50 to 13.00
Steel rails, rerolling	14.00 to 14.50
Iron rails	12.00 to 12.50
Iron car axles	18.00 to 19.00
Low phosphorus melting	13.00 to 13.50
Cast borings	9.00 to 9.25
Machine shop turnings	9.00 to 9.25
Mixed borings and short turnings	9.00 to 9.25
Compressed steel	9.00 to 9.50
Railroad wrought	12.00 to 12.50
Railroad malleable	12.50 to 13.00
Light bundled sheet stampings	6.00 to 7.00
Steel axle turnings	9.50 to 10.00
No. 1 cast	15.00 to 16.00
No. 1 busheling	8.75 to 9.00
Drop forge flashings, over 10 in.	8.75 to 9.00
Drop forge flashings, under 10 in.	7.50 to 8.00
Railroad grate bars	12.75 to 13.00
Stove plate	13.00 to 13.25
Pipes and flues	8.50 to 9.00

Birmingham

BIRMINGHAM, Feb. 6.

Pig Iron.—In spite of the fact that some iron has been sold under $16, the Birmingham base was nearer that than any other figure at the close of the first week in January and indications pointed to firming up. One maker reports the largest number of sales covering greater territory than in two months. Tonnage was not large, but indicated decidedly more active interest. It is understood that a Southern pipe maker secured Birmingham iron in a 500-ton lot at $15.50. This was made in competitive territory, also handrunning with sales both in the South and outside at $16. Pacific Coast business was at $16. Departures from the $16 base do not seem to have reflected abandonment of that base, but represented direct and keen competition in each instance. Trade seems to have learned to differentiate between Birmingham and Sheffield iron, the latter having a freight differential of 40c. to 80c. to competing points. Judging by reports from stove plants and other foundries, melt in the South is getting back toward the November capacity. One maker, who entered January with 2000 tons on books, shipped make and 1000 tons out of stocks. He entered February with 6000 tons on books for prompt delivery and will ship make and exhaust stocks. The tone of the market was altogether stronger at the end of the week than at the beginning. Several lots of 500 and 600 tons have been taken by Ohio and St. Louis melters, and Louisville melters took two 100-ton lots at $16 base. Pipe plants are buying more iron than in some time with indications of increasing tendency.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$15.50 to $16.00
Basic	15.00
Charcoal, warm blast	32.00

Finishing Mills.—For the first time in many months the Tennessee company this week went to 77 per cent of ingot production, seven of the nine open-hearth furnaces operating following six the week before, five the week before that and four to five average the past year. Bessemer plate, guide and bar mills are on double turn. The rail mill went from 6000 to 8000 tons. The structural steel mill resumed. The car works and tie-plate plant continue going. Seven thousand tons of rails for Japan left Mobile a few days ago. The Gulf States Steel Co. is resuming at its blast furnace, but open hearths are down.

Cast Iron Pipe.—A ship out of Mobile carried 3500 tons of high pressure and sanitary pipe to California points, including San Diego, San Francisco, Menlo Park, Alhambra, Calexico and several other points, with more to follow. Sanitary pipe is opening up slowly. Dome makers are guaranteeing against price declines. The base is $37. McWane Cast Iron Pipe Co. has begun making shipments of special handilengths of high pressure pipe and plans manufacture of pipe as small as one in. in diameter. Honolulu has taken a quantity. Birmingham makers expect to land the 3000-ton order for Schofield Barracks, Honolulu.

Coal and Coke.—Governor Kilby has offered to buy the properties of the Montevallo Mining Co., in bankruptcy, and operate them for the State with convicts. Convicts were used there by the company under lease. Coal operators do not like the plan and may contest the State's right to take this step. The matter is before the Federal court in bankruptcy. Coke is rather weak at $5 to $5.25.

Old Material.—Increasing operations at some steel plants give hope of some business there soon. Cast scrap is moving in fair quantities but dealers cannot get out of the district. The business is altogether unsatisfactory.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$11.00 to $12.00
No. 1 steel	10.00 to 11.00
No. 1 cast	14.00 to 15.00
Car wheels	13.00 to 14.00
Tramcar wheels	12.00 to 13.00
No. 1 wrought	12.00 to 13.00
Stove plate	11.00 to 12.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	6.00 to 7.00

Boston

BOSTON, Feb. 7.

Pig Iron.—The situation is uncertain in this territory. On the one hand, eastern Pennsylvania and Buffalo furnaces openly talk of stiffening prices, but definite information regarding going business is lacking. On the other hand, Northern iron is offered at $18.25, furnace, and it is still possible to obtain eastern Pennsylvania at $19.50 or less, depending on the tonnage involved. The only two sizable tonnage prospects, the Saco Lowell Shops, Boston, and the Gurney Heater Co., Framingham, Mass., have been covered. Sentiment among foundries is hopeful, but incoming business develops slowly and the gain in the daily New England melt is hardly perceptible. Comparatively few foundries are anticipating pig iron requirements. Purchases are mainly for the purpose of keeping enough stock on hand for mixture purposes, usually involving car lots. The pig iron market to-day is without its incentive. The trade can only guess what would happen if open bids on several round tonnages were asked at one time. Last week a Providence, R. I., melter inquired on a small tonnage of No. 2X iron. With the inquiry it was stated the buyer expected to do $18, furnace. A Buffalo interest offered $18.25, furnace. That price developed competition from eastern Pennsylvania iron interests. In addition to the above mentioned tonnages closed, the Malleable Iron Works, New Britain, Conn., has bought 200 tons No. 2X at private terms; a Massachusetts stove maker 500 tons No. 2X, Buffalo, at approximately $23.50 delivered and another Massachusetts foundry 200 tons No. 1X, Buffalo, at $19, furnace. Otherwise sales reported are confined to car lots at prices that suggest no stiffening in pig iron values, if silicon differentials are taken into consideration. Local Virginia furnace representatives say prospects of furnaces being blown in within the near future are bright.

We quote delivered at common New England points as follows, having added to furnace prices $4.06 freight from eastern Pennsylvania, $5.46 from Buffalo, $6.58 from Virginia and $10.66 from Alabama:

East. Penn., sil. 2.25 to 2.75	$24.06 to $24.56
East. Penn., sil. 1.75 to 2.25	23.56 to 24.06
Buffalo, sil. 2.25 to 2.75	23.71 to 24.96
Buffalo, sil. 1.75 to 2.25	23.71 to 24.46
Virginia, sil. 2.25 to 2.75	29.08 to 30.08
Virginia, sil. 1.75 to 2.25	28.58 to 29.58
Alabama, sil. 2.25 to 2.75	27.16
Alabama, sil. 1.75 to 2.25	26.66

Warehouse Business.—The movement of iron and steel out of warehouse stocks, in the aggregate, continues to improve, but slowly. Individual orders are for small amounts of stock, but more orders are coming in. The demand for sheets and structural steel is relatively better than that for bars, flats, etc. Jobbing prices on wire nails have been reduced from $3.50 and $3.75 to $3.40 per keg base, while cut nails have been reduced 10c. per 100 lb. to $4.15 per keg base. Wood screws are 2½ points lower on the print. The demand for bolts and nuts is expanding, but business is far from brisk.

Jobbers now quote: Soft steel bars, $2.55½ per 100 lb. base; flats, $3.05½; concrete bars, stock lengths, $2.55½; structural angles and beams, $2.65½; plates, $2.65½ to $2.83; tire steel, $3.85 to $4.25; open hearth spring steel, $4.50; crucible spring steel, $11.50; bands, $3.15½ to $3.53; hoop steel, $3.15½; cold rolled steel, $3.40 to $3.90; toe calk steel, $8; refined iron, $2.55½ per 100 lb. base; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $5.50; No. 10 blue annealed sheets, $3.48 per 100 lb. base; No. 28 black sheets, $4.50; No. 28 galvanized sheets, $5.50.

Coke.—Both the New England Coal & Coke Co., Boston, and the Providence Gas Co., Providence, R. I., have reduced their price on by-product foundry coke 25c. a ton to $10.15 delivered where the local freight rate does not exceed $3.40. The movement of coke from ovens to foundry yards shows the first encouraging increase noted in months. The movement is not based on any material increase in foundry outputs but rather on a desire to insure a supply of fuel should the threatened strike at the mines develop.

Old Material.—The market is less active, but no weakening in prices is noted. If anything, prices on some materials are firmer. For instance, as high as $9 was paid this week at shipping point for chemical borings, which represents an advance of about 25c. During the last few days, the upward tendency in borings prices has been checked by larger offerings by metal turning industries. Buying of machine shop turnings by Massachusetts nail and other interests has served to lift the market 75c. to $1. The nail maker is paying $6 delivered for turnings. Buying of blast furnace borings and turnings has strengthened quotations for the better offerings. Dealers are still paying $5 for forged scrap. A New England horseshoe maker, running full, is paying $15 delivered for railroad wrought, and buying every few days. Dealers' inquiries for horseshoes at $13.50 shipping point discloses a scarcity of such scrap. The market on machinery cast, stove plate, malleable, heavy melting steel, yard wrought, car axles, shafting and wheels is virtually at a standstill. Dealers and consumers apparently are as far apart on price as ever, with no indication of either side giving in.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$18.00 to $18.50
No. 2 machinery cast	16.00 to 16.50
Stove plate	15.00
Railroad malleable	13.00 to 13.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.00 to $9.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	9.50 to 10.00
Wrought pipe (1-in. in diam., over 2 ft. long)	7.00 to 7.25
Machine shop turnings	4.00 to 4.50
Cast iron borings, rolling mill	7.50 to 8.00
Cast iron borings, chemical	8.50 to 9.00
Blast furnace borings and turnings	3.50 to 4.50
Forged scrap and bundled skeleton	4.50 to 5.00
Street car axles and shafting	10.50 to 11.00
Car wheels	11.50 to 12.00
Rerolling rails	10.00 to 10.50

St. Louis

ST. LOUIS, Feb. 7.

Pig Iron.—An improvement is noted in the buying of pig iron, but this buying is still almost entirely confined to carload orders, which are for quick shipment. About the largest sale of the week was 150 tons, and the biggest inquiry pending is for 400 tons from a southern Indiana melter for first quarter delivery. One of the encouraging factors in the trade is the stove foundry situation. Buck's Stove & Range Co., one of the largest concerns in the district, resumed operations on Feb. 1. An adjustment of the labor situation is all that is keeping the Belleville, Ill., plants from resuming operations, and some of the Quincy, Ill., and Hannibal plants are operating. Southern iron has declined to $15.50, Birmingham, while the market for Northern iron is at $19, Chicago.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.88 freight and war tax from Chicago and $5.91 from Birmingham:

Northern foundry, sil. 1.75 to 2.25	$21.80
Northern malleable, sil. 1.75 to 2.25	21.80
Basic	21.80
Southern foundry, sil. 1.75 to 2.25	21.41

Finished Iron and Steel.—Business is quiet in the finished iron and steel trade. Pending adjustment of the labor situation here, the demand for structural material has fallen off until there is hardly anything being done. The contract for the Jewish Hospital at Memphis, Tenn., involving 300 tons of reinforcing bars, went to the James Alexander Construction Co., that city. The Vincennes Bridge Co. is getting prices for the 2000 tons of structural shapes for bridges at Muskogee and Gore, Okla., being undecided whether to buy the material already fabricated or to do the fabricating. The railroads centering in St. Louis have issued no inquiries for several weeks, and one line has issued instructions that no more buying be done until after March 1.

For stock out of warehouse we quote: Soft steel bars, 2.62½c. per lb.; iron bars, 2.62½c.; structural shapes, 2.72½c.; tank plates, 2.72½c.; No. 10 blue annealed sheets, 3.47½c.; No. 28 black sheets, cold rolled, one pass, 4.15c.; cold drawn rounds, shafting and screw stock, 3.65c.; structural rivets, $3.52½ per 100 lb.; boiler rivets, $3.62½; tank rivets 7/16 in. and smaller, 65 and 5 per cent off list; machine bolts, large, 60-10 per cent; small, 60, 10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 65-15 per cent; hot pressed nuts, square or hexagon blank, $4; and tapped, $3.75 off list.

Coke.—Foundries in the St. Louis district are buying more coke, but orders still are largely confined to carloads. Consumers are content to buy only as they

need the coke and order for immediate shipment. There is an improvement in the demand for domestic coke.

Old Material.—No buying by consumers and only a few transactions between dealers was the week's record in old material. The market remains weak and although no lowering of prices has been noted, the tendency is downward. Railroad offerings before the week follow: Chicago & Alton, 1200 tons Pennsylvania System (Southwestern Region), 5900 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Old iron rails	$14.00 to $14.50
Steel rails, rerolling	10.50 to 11.00
Steel rails, less than 3 ft.	12.50 to 13.00
Relaying rails, standard section	23.00 to 28.00
Cast iron car wheels	13.50 to 14.00
No. 1 heavy railroad melting steel	10.00 to 10.50
No. 1 heavy shoveling steel	9.75 to 10.00
Ordinary shoveling steel	9.50 to 10.00
Fogs, switches and guards, cut apart	10.00 to 10.50
Ordinary bundle sheet	4.00 to 4.50
Cast steel bolsters	9.50 to 10.00
Per Net Ton	
Heavy axles and tire turnings	6.00 to 6.50
Iron angle bars	13.00 to 13.50
Steel angle bars	9.00 to 9.50
Iron car axles	18.00 to 18.50
Steel car axles	12.50 to 13.00
Wrought iron arch bars and transoms	15.00 to 15.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.50 to 9.00
Railroad springs	10.00 to 10.50
Steel couplers and knuckles	10.00 to 10.50
Locomotive tires, 42 in. and over, smooth inside	8.00 to 8.50
No. 1 dealers forge	8.00 to 8.50
Cast iron borings	5.50 to 6.00
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut in sheets and rings	6.00 to 6.50
No. 1 railroad cast	12.00 to 12.50
Stove plate and light cast	11.00 to 11.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	9.00 to 9.50
Pipes and flues	7.50 to 8.00
Heavy railroad sheet and tank	5.50 to 6.00
Light railroad sheet	3.50 to 4.00
Railroad grate bars	9.50 to 10.00
Machine shop turnings	3.00 to 3.50
Country mixed iron	6.00 to 6.50
Uncut railroad mixed	7.00 to 7.50
Horseshoes	9.50 to 10.00
Railroad brake shoes	9.50 to 10.00

Buffalo

BUFFALO, Feb. 6.

Pig Iron.—Prices have weakened and the market is quiet. A base price of $18.50 is quoted by one furnace and $19 is quoted on any tonnage by several others, but no big business has developed out of these concessions. Sales for the week did not exceed 7000 tons and were principally carload lots. Inquiry for delivery later than second quarter has not appeared up to date and the only request for prices on iron for late in the year is in connection with the vehicular tunnel project, but no Buffalo furnace has deviated from the policy not to try for this business under present conditions. A furnace which has contracts of long standing finds encouragement in shipping instructions just received which call for the shipment of 1000 tons per month until further notice.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$19.50 to $20.00
No. 2X foundry, 2.25 to 2.75 sil.	19.00 to 19.50
No. 2 plain, 1.75 to 2.25 sil.	18.50 to 19.00
Basic	18.00 to 18.25
Malleable	19.50
Lake Superior charcoal	31.75

Finished Iron and Steel.—Except for a lively demand for certain wire products such as cloth and netting, the market is apathetic. Orders are small and little of any unusual interest is apparent. Sheet prices are firmer than any other and on a 200-ton inquiry for black sheets sent out by a Buffalo buyer, every mill quoted 3c. The largest bar inquiry now engaging mills and agencies is one for 500 tons and prices as low as $1.42½ have been quoted. Structural business is unusually dull. The local Erie Railroad car shops have been taken over by a corporation formed for that purpose and known as the Seminole Construction Co. William H. Fitzpatrick, Jr., is the president. Sellers are informed that agitation for more favorable freight rates has something to do with the lack of interest in products.

Old Material.—Brokers are interested in obtaining prices on 25,000 tons of turnings and borings and a few dealers who are in touch with various tonnages in these products are quoting $12 on borings and $11 on turnings, delivered Pittsburgh. Production is extremely light and it is not likely the order could be placed here in full if the prices are found favorable. The steel situation is unchanged and prices have not been advanced.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$13.00 to $14.00
Low phos., 0.04 and under	17.00 to 18.00
No. 1 railroad wrought	15.00 to 16.00
Car wheels	16.50 to 17.50
Machine shop turnings	7.50 to 8.00
Cast iron borings	7.00 to 8.00
Heavy axle turnings	10.50 to 11.50
Grate bars	12.00 to 13.00
No. 1 busheling	10.00 to 11.00
Stove plate	15.00 to 16.00
Bundled sheet stampings	8.00 to 9.00
No. 1 machinery cast	17.00 to 18.00
Hydraulic compressed	10.50 to 11.50
Railroad malleable	13.00 to 14.00

Warehouse Business.—An increase in the number of orders but for slightly less quantities is noted, but generally warehouse business is dull.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 2.65c.; plates, 2.65c.; plates, No. 8 gage, 3.35c.; soft steel bars and shapes, 2.55c.; hoops and bands, 3.15c.; blue annealed sheets, No. 10, 3.40c.; galvanized steel sheets, No. 28, 5.25c.; black sheets, No. 28, 4.25c.; cold-rolled strip steel, 5.90c.; cold-rolled round shafting, 3.40c.

Cincinnati

CINCINNATI, Feb. 7.

Pig Iron.—The Cincinnati market was rather quiet during the week, but indications point to a more active period just ahead. In the district proper, few sales of any consequence were reported, and even carload business fell off somewhat. The more important sales were one of 300 tons of Southern to an Indiana melter at $15.50 base, Birmingham; one of 200 tons of Southern to a Kentucky melter at the same figure; another of 250 tons of lake iron to a Dayton melter at a price reported to be $18, furnace base, and 250 tons of Jackson County silvery at the full schedule. Outside the district, a sale of 1,000 tons of Chicago iron was made to a Michigan melter at around $18.75 furnace. Inquiries current include one for 500 tons from a central Ohio manufacturer; one from an Indiana sanitary manufacturer for 500 tons; one from a western Indiana melter for 400 tons, equal parts of Northern and Southern, and a 350-ton inquiry for high silicon iron from Indianapolis. A Michigan melter is also inquiring for 500 tons of malleable and an Indiana manufacturer is expected to enter the market shortly for a round tonnage of basic. Prices show little change, but weakness in some markets is more apparent. At least two Southern furnaces are now quoting $15.50, base and it is reported that lake furnaces have shaded $18. Chicago iron is regularly quoted at $18.75 to $19. Southern Ohio furnaces are adhering firmly to $19.50 to $20 and sales have been made at both figures. On Bessemer iron it is said that $19, Ironton basis has been done. Settlement of the molders' strike in Cincinnati and some adjacent cities is looked upon as an encouraging sign and it is expected that a slow but steady increase in the melt will be seen from now on.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$20.00 to $20.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	20.50 to 21.00
Ohio silvery, 8 per cent sil.	32.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	22.02 to 22.52
Basic, Northern	21.02
Malleable	22.02 to 22.52

Finished Material.—The past week was rather quiet in the finished material market, the largest order reported being for 300 tons of structural material for stock purposes. A tentative inquiry for several hundred tons of sheets is before the trade and will probably be placed if the buyer can develop a price of 3.75c. on galvanized sheets. It is reported that this price can now be done from some of the small mills on orders of 100 tons or over, as a local buyer claims to have placed

recently an order for 500 tons of galvanized sheets at this figure. The larger companies, however, are strictly maintaining the 3c. and 4c. base and report during the week a slight improvement in the number of orders placed. There is no indication of buyers contracting ahead, as most of the orders placed are for one and two carloads for immediate shipment. The same condition also applies to bars, shapes and plates. Reinforcing bars, however, are in more demand, as some projects involving 100 tons and over, are before the trade. On wire products, there is a fair demand for wire fence and wire nails, but prices are inclined to weakness, reports having been heard of a $2.40 base on nails during the week. Low prices are hard to confirm, but some sellers, who are quoting the regular prices which have been in effect for some time are losing orders and the supposition is that smaller mills are taking the business at lower figures. Prices on bars, shapes and plates are about the same as last week, 1.45c. being the regular price on small tonnages with 1.40c. for larger tonnages. In the structural field, there is very little activity, and no new projects have come up. The only award made during the week was a high school building for Columbus, Ohio, to a Detroit general contractor. This project will involve 200 tons of structural steel. The Federal Reserve Bank building at Nashville, Tenn., which will take a substantial tonnage, is held up for the time being. A number of projects involving considerable tonnages of reinforcing bars are up, including an office building for the Edwards Mfg. Co., Cincinnati, a Masonic hall at Dayton, Ky., and addition to the auditorium of the National Cash Register Co. Dayton, Ohio. The Business Men's Club building at Cincinnati is also up for bids. This involves 150 tons of structural steel and about 800 tons of reinforcing bars. Plans have also been approved for a viaduct at Cincinnati to cost $1,500,000. This work will probably come up later for bids. Chicago and New York capitalists are reported to have purchased property in Columbus, Ohio, and will erect two apartment buildings costing $1,000,000 each. The Jersey Cereal Food Co., Cereal, Pa., is planning the erection of a new plant somewhere in the Middle West and it is expected that Columbus, Ohio, will be favorably considered.

Warehouse Business.—Warehouse business is unusually quiet, orders during the week being few. Local warehouses are suffering somewhat from mill competition, as no order apparently is too small for a mill to place on its books. Some activity is reported by wire and nail jobbers. Prices are unchanged.

Iron and steel bars, 2.75c. base; hoops and bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold rolled rounds, 1¼ in. and larger, 3.50c. base; under 1¼ in. and flats, squares and hexagons, 4c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; wire nails, $3.00 per keg base; No. 9 annealed wire, $2.85 per 100 lb.

Coke.—There is more activity in the coke market, but whether this movement has any connection with the threatened coal strike or increasing foundry operations is hard to determine. At any rate, inquiries are more plentiful, and prices have a tendency to stiffen. Some producers of domestic coke have raised their prices 15c. a ton, the quotation now being $2.90, Connellsville. Other prices are unchanged.

Old Material.—There is absolutely nothing being done in the scrap market in this district, according to dealers. Consumers are apparently going to liquidate present stocks before replenishing, and dealers are expecting an advancing market when buying is resumed.

We quote dealers' buying prices, f.o.b. cars:

	Per Gross Ton	
Bundled sheets	$3.50 to	4.00
Iron rails	12.00 to	12.50
Relaying rails, 50 lb. and up	25.00 to	26.00
Rerolling steels rails	10.50 to	11.00
Heavy melting steel	9.00 to	9.50
Steel rails for melting	9.00 to	9.50
Car wheels	12.00 to	13.00
	Per Net Ton	
No. 1 railroad wrought	8.50 to	9.50
Cast borings	3.00 to	3.50
Steel turnings	2.00 to	2.50
Railroad cast	12.00 to	12.50
No. 1 machinery	13.50 to	14.50
Burnt scrap	7.50 to	8.00
Iron axles	15.50 to	16.50
Locomotive tires (smooth inside)	9.50 to	10.00
Tires and flues	4.00 to	4.50

Philadelphia

PHILADELPHIA, Feb. 7.

What change there is in the steel trade in this section is for the better. One manufacturer of plates reports that business in January was the largest in any month since November, 1920. Thus far in February, the January record has been maintained. Another plate maker has five furnaces active. These furnaces were idle in December; ingot output is about 35 per cent of capacity. An eastern Pennsylvania tin plate producer notes a decided improvement in specifications against contracts. The local office of a large Pittsburgh producer reports tin plate mills beginning to-day operating at 90 per cent capacity; 75 per cent of the wire mills employed and all the furnaces in the pipe department active, but bars, shapes and structural mills still limping along at 30 to 40 per cent of capacity.

Pig Iron.—Sales of 10,000 to 12,000 tons of foundry iron have come to the surface. To-day the Thatcher company closed for 2500 tons. The Richardson & Boynton Co. has distributed orders for 5000 tons among four furnaces; two in eastern and two in central Pennsylvania. The prices obtained were $20 to $20.50 for No. 2X and $19.50 to $20 for No. 2 plain. The Central foundry bought about 1000 tons from two eastern Pennsylvania furnaces and is believed to have bought an additional 1000 from other producers. Another foundry has closed for about 1000 tons. Central Pennsylvania furnaces also received a share of the contract placed by the Saco-Lowell shops. The remainder of the business went to Buffalo furnaces. There is a difference of opinion in regard to prices obtained on this latter tonnage, but it is understood to have been on the basis of $18.50 Buffalo for No. 2 plain, although it is claimed that this price was shaded for some Massachusetts orders. A number of small orders for prompt shipment were taken by other eastern Pennsylvania furnaces, ranging from 100 to 500 tons each. Deliveries on the larger tonnages are to begin in February and extend over the second quarter of the year. In one case, delivery will extend into the third quarter. One sale of special gray forge iron amounting to 500 tons was made at $19 furnace. The A. P. Smith Co. is now in the market for 800 tons of foundry grades and other small inquiries bring the total pending to between 3000 and 4000 tons. A cast iron pipe manufacturer may possibly be in the market to cover a recent contract for 5000 tons of gas pipe, but this interest made some large pig iron purchases early in December. The Westinghouse Electric & Mfg. Co. has an inquiry out for about 1000 tons including 700 tons of foundry grades and 300 tons of malleable and high silicon; the latter only 50 tons. A sale of Virginia iron—high silicon—has been made at $23.50 furnace, to be shipped from stock. This is equivalent to about $20.50 for 1.75 to 2.25 silicon. Steel-making iron is dull. Most of the users of basic iron have covered their requirements and there is no inquiry in the market now for an appreciable tonnage. One sale of 600 tons of copper-bearing low phosphorus has been made at $28 furnace; standard, copper free metal is neglected. The Eastern Steel Co. is seriously considering blowing-out the Warwick furnace and the Colonial furnace will probably be idle on March 1 unless there is a decided change for the better in prices.

The Swede furnace No. 3 has been blown in preparatory to blowing out No. 2 speedily.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to $1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.84 to	$21.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.34 to	21.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.24 to	27.74
Virginia No. 2X, 2.25 to 2.75 sil.	27.74 to	28.24
Basic delivery eastern Pa.		19 84
Gray forge	20.50 to	21.50
Malleable	23.00 to	24.00
Standard low phos. (f.o.b. furnace)		30.00
Copper bearing low phos. (f.o.b. furnace)		28.00

Billets.—Demand from home consumers is light. Rerolling are still available at $28 to $29 and forging billets at $32 to $33, f. o. b. Pittsburgh. Some few sales have been made by Eastern mills on this basis. There is still some export inquiry in the market for

billets and sheet bars upon which domestic prices have been cut several dollars a ton.

Ferroalloys.—No improvement is noted in the demand, but several small sales have been made on a basis of $58.35 seaboard. Spiegeleisen is quiet, but firm. Output is inconsiderable and stocks on furnace banks have been reduced. It is estimated that not more than 500 tons are available in the district, and this is nearly all low grade. Eighteen to 20 per cent alloy is quotable at $25 to $27 furnace.

Plates.—Manufacturers are more hopeful. Output is better. Specifications against contracts are larger. One manufacturer reports business taken in January as the largest since November, 1920. Orders taken from manufacturers of storage tanks and steel barrels are more encouraging. Several orders have also been received from shipbuilders for repair work, mainly for marine boilers. The outlook from a price standpoint leaves much to be desired by sellers, while one maker is or possibly two are obtaining 1.50c. base, Pittsburgh, for small lots, others are making sales at 1.40c. to 1.45c. base. This includes Pittsburgh as well as eastern Pennsylvania mills The postponement of the interstate vehicular tunnel contract until Feb. 15 makes no change in the general situation. One order for 200 tons of plate for car repair work has been taken by a local mill at close to 1.40c. base. We quote plates 1.40c. to 1.50c. Pittsburgh.

Structural Material.—Bookings of orders for structural shapes have been at the expense of prices, although some mills are holding out strenuously for 1.50c., base. Some orders for plain material have been taken for 1.40c. to 1.45c., Pittsburgh. Fabricators have been the principal buyers. Among the prospective contracts in this territory are 2000 tons for the Curtis Publishing Co. building, 1500 tons for the Public Library and 1500 to 2000 tons for the Benjamin Franklin Hotel to be erected on the site of the Continental Hotel. Bethlehem fabricators recently secured an order for 500 tons of shapes for the Wesley Hotel, but this project now seems to be held in abeyance.

Rails.—The Southern Railway has ordered 8500 tons of 100-lb. rails for the Tennessee company but has postponed until spring the purchase of 26,000 of 85-lb. sections. The Western Maryland inquiry for 4000 tons is held in abeyance. The Baltimore & Ohio is still negotiating for 17,000 tons. The C. & O. inquiry for 26,000 tons includes 4000 tons for the Hocking Valley.

Bars.—A few more inquiries are in the market and some few additional sales have been made at 1.40c., base, Pittsburgh. Among the new inquiries in the market are 1500 tons of concrete bars for the Detroit reservoir. Inquiries are still pending on about 4000 tons. Bar iron makers quote 1.40c. to 1.45c. base, Pittsburgh.

Rivets.—An order for 500 tons of special quality rivets is understood to have been placed to-day by the Merchant Shipbuilding Co., Chester, at close to 2c. per lb. These are to be utilized in the manufacture of steel pipe for the New York aqueduct.

Warehouse Business.—Some slight improvement is reported in the placing of orders for black and galvanized sheets and for structural shapes. Prices are without essential change and are as follows for Philadelphia, delivered:

Soft steel bars and small shapes, 2.50c.; iron bars (except bands), 2.50c.; round edge iron, 2.80c.; round edge steel, iron finish, 1½ x ½ in., 2.95c.; round edge steel planished, 3.70c.; tank steel plates, ¼-in. and heavier, 2.75c.; tank steel plates, 3/16-in., 2.925c.; blue annealed steel sheets, No. 10 gage, 3.50c.; light black sheets, No. 28 gage, 4c.; galvanized sheets, No. 28 gage, 5c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.60c.; diamond pattern plates, ¼-in., 4.60c.; 3/16-in., 4.785c.; ⅛-in., 4.90c.; spring steel, 4.10c.; round cold-rolled steel, 3.25c.; squares and hexagons, cold-rolled steel, 3.75c.; steel hoops, No. 13 gage and lighter, 3.25c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.10c.; iron bands, 3.90c.; rails, 2.75c.; tool steel, 8c.; Norway iron, 5c.; toe steel, 4.50c.

Coke.—Buying of furnace coke is confined within narrow limits, but the market remains firm at $3.25, Connellsville. Foundry coke ranges from $3.75 to $4.50 at ovens according to quality, but the bulk of the sales are at $4 to $4.50, ovens.

Old Material.—Steel mills have bought additional lots of heavy steel melting scrap ranging from 1000 to 2000 tons each. Purchases previously made are a little larger than reported. Aggregate sales in the last two weeks have been about 15,000 tons. Midvale is still buying at $12.50 delivered, Nicetown, and $11.50 delivered, Coatesville. The Bethlehem Steel Co. has bought at $12 to $12.50. Pencoyd has been buying at $12. Alan Wood is bidding $12 and the Worth Steel Co. is paying $12, delivered. Cast iron car wheels are quotable at $15 to $16. Steel car axles are nominal at $17.50 to $18.50. One Eastern mill is reported to be buying railroad steel at $11.75. There is still considerable interest in the offering of 105,000 tons at the Hog Island shipyard by the Shipping Board. Bids will be received until noon, Feb. 15. We quote various grades of old material for delivery at consumers' works in this district as follows:

No. 1 heavy melting steel	$12.00 to $12.50
Scrap rail	12.00 to 12.50
Steel rails, rerolling	15.00 to 15.50
No. 1 low phos., heavy 0.04 and under	18.00 to 19.00
Cast iron car wheels	15.00 to 15.50
No. 1 railroad wrought	14.50 to 15.00
No. 1 yard wrought	12.00 to 12.50
No. 1 forge fire	10.00 to 10.50
Bundled sheets (for steel works)	9.50 to 10.00
No. 1 busheling	11.00 to 12.00
No. 2 busheling	9.00 to 10.00
Turnings (short shoveling grade for blast furnace use)	9.25 to 10.25
Mixed borings and turnings (for blast furnace use)	9.25 to 10.25
Machine-shop turnings (for rolling mill and steel works use)	9.00 to 9.50
Heavy axle turnings (or equivalent)	9.50 to 10.00
Cast borings (for steel works and rolling mills)	12.00 to 12.50
Cast borings (for chemical plants)	13.50 to 14.00
No. 1 cast	16.50 to 17.00
Railroad grate bars	14.00 to 14.50
Stove plate (for steel plant use)	14.00 to 14.50
Railroad malleable	12.50 to 13.50
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to 12.50
Iron car axles	No market
Steel car axles	17.00 to 18.50

GERMANY NOT A COMPETITOR

German Prices as High or Higher Than American —Japan Buys Wire, Nails and Sheets

NEW YORK, Feb. 7.—A slight improvement in the export situation seems evident, although business is still largely confined to Far Eastern buying and inquiring. Part, at least, of the present improved condition in export selling is probably caused by the better situation of American sellers on price. German competition in Far Eastern markets, which a few months ago threatened to become extremely serious, has gradually receded as Continental prices increased and exchange magnified the difference. To-day, German sellers, in the great majority of cases, are forced to quote f.o.b. Hamburg a price equivalent to, or higher than, the American quotations f.o.b. Pittsburgh. This is true of steel bars, structural material and plates, and on blue annealed sheets, wire nails and heavy gages of plain wire the German price is distinctly higher. A New York exporter who in November filled orders from customers in Japan for blue annealed sheets, placing them in Germany at an average price of $40 per ton, found the price up to $57 per ton in December and $60 per ton and higher now, which brings the German quotation above the prevailing American price. German wire nails, which last summer and early in the fall of 1921 were considerably lower in price than the American product, are now from 25c. to 35c. per keg higher as a rule and difficult to obtain on early delivery.

The recent report, published in some papers, of a 15,000-ton rail order being placed by a Southern railroad with the Hugo Stinnes interests and later canceled is without substantial foundation.

Bids have been opened in Japan on the inquiry of the South Manchuria Railway Co. for between 6000 and 7000 tons of heavy rails. Quotations of American mills are reported to have been $47 per ton, c.i.f. Dairen, in one instance, and about $46.25 per ton in another. Several other fair-sized contracts for various kinds of material for Japan are still pending. For example, the Imperial Government Railways of Japan are in the market for 10,000 tons of 60-lb. rails.

America lost 12,000 tons of rails for Brazil to Belgium. American plate makers fear that they cannot get an attractive plate order from India largely because of the high ocean freights. At the present time it is found difficult to compete with Europe on the heavy tonnage products.

British Iron and Steel Market

Pig Iron Quieter—Steel Business Slack—Coke a Trifle Higher—Pig Iron and Tin Plate Lower—Exchange Much Firmer

(By Cable)

LONDON, ENGLAND, Feb. 7.

As consumers are apparently satisfied with respect to their urgent demands, the pig iron market is quieter. Scotland is still receiving iron of Continental make under old contracts. Germany is taking fair quantities of Cleveland pig iron.

Hematite is weak. Mixed numbers are being sold at £4 10s. ($19.53). The home trade is generally inactive, but export demand is improving.

Bilbao Rubio is now sold at 25½s. ($5.53) ex-ship Tees. Scotland has purchased some French ore at 20s. ($4.34) ex-ship Tees.

Scotch Durham coke is firmer, on Continental demand.

English steel makers are resuming operations, fixing minimum home quotations on ship plates at £10 10s. (2.03c. per lb.); on sections at £10 (1.94c. per lb.) basis, delivered. Business generally is slack. Wages of North-eastern Coast workers have been reduced 33¾ per cent; of Midlands workers, 20 per cent.

Clyde shipbuilding for January consisted of eight vessels launched, amounting to 52,062 gross tons register.

Belgian merchants have sold merchant bars at £8 9s. (1.64c. per lb.); rods at £9 17½s. (1.91c. per lb.); both c.i.f., India. French merchant bars are sold at £8 5s. to £8 10s. (1.60 to 1.65c. per lb.) f.o.b., for April and May delivery. Belgian structural steel is held at £7 7½s. to £7 10s. (1.43 to 1.45c. per lb.) f.o.b. Luxemburg beams are quoted at £7 10s. to £7 15s. (1.45 to 1.50c. per lb.) f.o.b., for April and May shipment. Belgian wire rods are held at £8 15s. to £9 ($37.98 to $39.06) f.o.b., for April and May delivery.

German plates are priced at £8 5s. (1.60c. per lb.) f.o.b, for April and May shipment. German merchants are quoting wire rods (country of origin not specified) at £8 17½s. ($38.52) f.o.b.

Continental foundry pig iron is priced at £5 ($21.70) per ton.

Tin plate is easier on acceptance by the works of low bids offered by merchants covering orders. March delivery has sold at 18¾s. ($4.07) f.o.b. A substantial oil order has been placed at a cheap price. Wasters are easier, sellers of 20 x 14-in. asking 18½s. ($4.01) f.o.b.

Merchants have sold, to Indian specifications, black sheets at £12 10s. to £13 15s. (2.42 to 2.66c. per lb.) c.i.f. Japanese specifications have been done at £16 (3.10c. per lb.) f.o.b.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.34 per £1 as follows:

Durham coke, delivered	£1	6s.	to	£1	7s.		$5.64	to $5.86
Cleveland No. 1 foundry	4	15					20.62	
Cleveland No. 3 foundry	4	10					19.53	
Cleveland No. 4 foundry	4	7½					18.99	
Cleveland No. 4 forge	4	10					19.53	
Cleveland basic	4	10					19.53	
Hematite	7	0*					30.38*	
East Coast mixed	4	10	to	4	12½		19.53	to 20.07
Ferromanganese	15	0	&	14	10*		65.10	& 62.93*
Rails, 60 lb. and up	8	0	to	9	10		34.72	to 41.23
Billets	7	0	to	7	10		30.38	to 32.55
Sheet and tin plate bars, Welsh	7	5	to	7	7½		31.47	to 32.01
Tin plates, base box	0	18¾	to	0	19¼		4.07	to 4.18
							C. per Lb.	
Ship plates	9	0	to	10	10		1.74	to 2.03
Boiler plates	12	10	to	14	0		2.42	to 2.71
Tees	9	10	to	11	0		1.84	to 2.13
Channels	8	15	to	10	5		1.70	to 1.99
Beams	8	5	to	10	0		1.60	to 1.94
Round bars, ¾ to 3 in.	10	10					2.03	
Galvanized sheets, 24 g.	15	12½	to	16	0		3.03	to 3.10
Black sheets	12	15	to	13	0		2.47	to 2.52
Steel hoops	12	0	&	12	5*		2.33	& 2.37*
Cold rolled steel strip, 20 g.	24	5					4.70	

*Export price.

Continental Pig Iron Eliminated—Steel Prices Now Competing with Continent—Low Output of Ships

LONDON, ENGLAND, Jan. 25.—Conditions continue to improve, though the recovery is only gradual. The reducing of Cleveland pig iron to a basis price of 90s. has considerably augmented the demand and consumers, finding that hopes of any further concessions are improbable for some time, have once more started to buy. The result has been that makers have been enabled to get more furnaces going, thus helping to relieve the unemployment and also to reduce standing charges. Scotland, an important consumer of Cleveland pig iron, is able to buy fairly well now, as the steamer freight rates have been reduced, while export markets are showing a good deal more interest and of late sales have been made to Scandinavia and also to Germany. Continental pig iron is quite out of the running, not only on account of the uncertainty of shipments, but British pig iron is considerably cheaper than continental, few makers of the latter offering foundry iron at less than 100s. f.o.b.

The recovery in the hematite iron trade is not so rapid as in the foundry. There is a certain demand which has enabled makers to relight additional furnaces but the business moving is not sufficient to stabilize values. Makers are very keen for orders that are about and are ready to grant concessions, with the result that East Coast mixed numbers are now freely obtainable at 95s.

In finished iron and steel, inquiry increases, mostly for export, and a fair amount of business is being done but works in general are only partly employed. Makers, however, are somewhat stiffer in their price attitude, maintaining that to sell at anything below the official minimum quotations is a loss, and therefore they are not keen to cut values further. One of the main hindrances to the developments of the home trade are, of course, the large costs still involved in transport and in the general manufacturing costs to the consumers in working up material to the finished article.

It is encouraging to see that the volume of business going to continental works is decreasing as British prices more nearly approach those of the continent, or rather as the continental prices go up. There seems to be no relief in respect of shipments from that side, which are greatly in arrears, due, it is stated, almost entirely to the acute shortage of fuel.

Shipbuilding is still in a bad way as will be seen by the following notes from Lloyds Register. The merchant tonnage in construction in the United Kingdom for the quarter ended Dec. 31 was 2,640,319 tons while the total gross tonnage launched during the year was 1,538,052 tons, representing a reduction of over 500,000 tons compared with 1920, which was a record year, and over 300,000 tons less than the tonnage launched in 1913. The world's total shipbuilding output for 1921 is given as 4,341,679 tons, being a decrease of about 1,500,000 tons over 1920. The largest vessel launched in this country was the "Laconia" for the Cunard Line, of 19,730 tons. The Clyde production for the last year declined by over 175,000 tons while the Wear output was over 170,000 tons less than in 1920. The following figures represent the shipbuilding output for 1921 of the various countries as stated: United Kingdom, 1,538,052 tons; United States, 1,006,413 tons; Germany, 509,064 tons; Holland, 232,402 tons; Japan, 227,425 tons; France, 210,633 tons, and Italy, 164,748 tons.

The Erie Foundry Co., Erie, Pa., recently shipped one of its new improved type sheet galvanizing plants to the Empire Rolling Mill Co., Cleveland. Two of these galvanizing units have been ordered by the Otis Steel Co., Cleveland, for installation at its Riverside Works, and will be shipped shortly.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Feb.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
1.....	13.62½	13.37½	31.75	4.70	4.40	4.85	4.50
2.....	13.50	13.25	31.75	4.70	4.40	4.85	4.50
3.....	13.50	13.25	31.50	4.70	4.40	4.85	4.50
4.....	13.50	13.25	....	4.70	4.40	4.85	4.50
6.....	13.50	13.25	31.62½	4.70	4.40	4.85	4.50
7.....	13.50	13.25	32.00	4.70	4.40	4.85	4.50

*Refinery quotations.

New York

NEW YORK, Feb. 7.

Conditions in all the markets are changed but slightly. Demand for copper and zinc continues very light with prices lower for copper. The lead market is the strongest of all and there has been some moderate activity in tin, prices in both markets being steady.

Copper.—One of those periods of seasonable dullness, which frequently characterize the copper market, has prevailed for some weeks and there is very little demand either from domestic or foreign consumers. Electrolytic copper is available from some of the large producers at 13.75c., delivered, as contrasted with 13.87½c. and 14c. a week ago and from small producers it can be bought at 13.50c., delivered, or 13.25c., refinery, which is the prevailing level at which business is being done. From a few dealers and speculators small lots are reported obtainable as low as 13.37½c., delivered, but such cases are few. The principal cause of the light demand is the heavy buying in the last quarter of last year and also an expectation on the part of some consumers that the starting up of the copper mines will increase supplies of refined copper. Lake copper, in sympathy with electrolytic, is slightly lower.

Tin.—In the past week, Feb. 3 and 4 were the most active days, but as a whole the market has been quiet. Previous to those days there were sellers who held firmly at quotations which were sufficiently higher than buyers' prices at all times so that a deadlock resulted and the market was stagnant. On one of the two days referred to, or Feb. 3, dealers were the principal buyers and about 200 tons of forward tin was sold, mostly at 30.75c. to 30.87½c. On Feb. 4 a large independent tin plate maker inquired for liberal amounts with the result that some orders for future delivery were placed at 31c. to 31.12½c. Yesterday and to-day have been very quiet with the quotation for spot Straits to-day at 32c., New York. The London market for spot standard tin to-day was £155 15s., future standard at £157 15s., and spot Straits £158 5s., all about £3 to £4 per ton less than a week ago. Deliveries into consumption in January are reported to have been 4275 tons, with metal in stocks and landing on Jan. 31 at 1331 tons. Imports for the month were 3910 tons, against 1245 tons in January, 1921. Arrivals thus far this month have been 645 tons, with 8460 tons reported afloat.

Lead.—Prices are unchanged and demand continues steady. The leading interest continues to quote 4.70c., New York and St. Louis, while from the independents the metal can be bought at no less than 4.40c., St. Louis, or 4.70c. to 4.75c., New York and Eastern points.

Zinc.—After declining almost daily for several weeks the market for prime Western zinc may be characterized as firmer, in that quotations have remained steady for a week at 4.50c., St. Louis, or 4.85c., New York, which is the quotation for early delivery. There is some disposition to quote futures on the same basis, but this is not general. Demand does not improve and is only of the hand-to-mouth order.

Antimony.—Wholesale lots for early delivery are unchanged in a quiet market at 4.40c. per lb., New York, duty paid.

Aluminum.—The leading interest continues to quote virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery at 19c. to 19.10c. per lb., f.o.b. plant, depending on the quantity. The same grade through importers is obtainable at 17c. to 18c., New York, duty paid.

Old Metals.—The market is very depressed with values slightly lower. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.00
Copper, heavy and wire	12.00
Copper, light and bottoms	9.25
Heavy machine composition	10.00
Brass, heavy	7.75
Brass, light	5.75
No. 1 red brass or composition turnings	8.00
No. 1 yellow rod brass turnings	6.00
Lead, heavy	4.25
Lead, tea	3.25
Zinc	3.00

Chicago

FEB. 7.—Tin is stronger and while a little business has been closed in this metal, the situation is still far from satisfactory. Inquiry for copper has improved slightly but, on the whole, this metal is weaker and declines are looked for. Lead, zinc and antimony are quiet. In the old metals copper wire, crucible shapes and clips have declined while yellow brass has advanced. We quote in carload lots: Lake copper, 13.50c.; tin, 33c. to 33.50c.; lead, 4.50c.; spelter, 4.60c.; antimony, 6.50c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 9.50c.; copper bottoms, 7.50c.; red brass, 7.50c.; yellow brass, 6c.; lead pipe, 3.25c.; zinc, 2c.; pewter, No. 1, 22c.; tin foil, 23c.; block tin, 25c.; all buying prices for less than carload lots.

President Orders Naval Work Stopped

WASHINGTON, Feb. 7.—One of the immediate effects of the Conference on Limitation of Armaments, which came to an end here yesterday, was an order by the President suspending work at once on all naval vessels it is proposed to scrap and also to discontinue work on fortifications in Guam and the Philippine Islands. Announcement of the suspension of this work was made to-day at the White House. It was stated, however, that no permanent discontinuance of the work will be ordered unless and until the Senate ratifies treaties drawn up by the conference. Meanwhile contracts for steel for ships to be scrapped and for fortifications are being held up and if ratification of treaties as proposed is made, the contracts will be canceled, it is understood, and necessary adjustments made.

Mr. Dupuy Sues Crucible Steel Co. of America

PITTSBURGH, Feb. 7.—Herbert Dupuy, former chairman Crucible Steel Co. of America, has entered suit against the company in United States District Court here for $162,048, to reimburse him for expenses incurred by him as a result of defending himself on charges brought by the Government alleging conspiracy to defraud the Government in connection with Federal income tax returns. Mr. Dupuy was acquitted. He claims that the expenses were entirely the result of acts done by him as an officer of the company and in the interests of the company, and that the company has refused to reimburse him.

Recent boiler developments are to be discussed at a meeting to be held jointly on the evening of Feb. 15 by the New York section of the American Society of Mechanical Engineers and the Stevens Engineering Society at Stevens Institute of Technology, Hoboken, N. J. The chief speaker will be V. Z. Caracristi, consulting engineer, New York, who will consider particularly the 2640 hp. Ladd boilers at the River Rouge plant of the Ford Motor Co.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	$0.36	Kansas City	$0.815
Philadelphia, export	0.265	Kansas City (pipe)	0.77
Baltimore, domestic	0.35	St. Paul	0.665
Baltimore, export	0.255	Omaha	0.815
New York, domestic	0.38	Omaha (pipe)	0.77
New York, export	0.285	Denver	1.35
Boston, domestic	0.405	Denver (wire products)	1.415
Boston, export	0.285	Pacific Coast	1.665
Buffalo	0.295	Pacific Coast, ship plates	1.335
Cleveland	0.24	Birmingham	0.765
Detroit	0.325	Jacksonville, all rail	0.555
Cincinnati	0.325	Jacksonville, rail and water	0.46
Indianapolis	0.345	New Orleans	0.515
Chicago	0.38		
St. Louis	0.475		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, **1.40c. to 1.50c.**

Sheared plates, ¼ in. and heavier, tank quality, 1.50c.

Wire Products

Wire nails, $2.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.25 and shorter than 1 in., $1.75; bright Bessemer and basic wire, $2.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $2.25; galvanized wire, $2.75; galvanized barbed wire, $3.15; galvanized fence staples, $3.15; painted barbed wire, $2.65; polished fence staples, $2.65; cement-coated nails, per count keg, $2.00; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 68 to 70½ per cent off list for carload lots; 67 to 69½ per cent for 1000-rod lots, and 66 to 68½ per cent for small lots, f.o.b. Pittsburgh.

Bolts and Nuts

Machine bolts, small, rolled threads,
70, 10 and 5 to 70, 10 and 7½ per cent off list

Machine bolts, small, cut threads,
70 and 5 to 70 and 10 per cent off list

Machine bolts, larger and longer,
65, 10 and 5 to 70 and 10 per cent off list

Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter rolled threads,
65, 10 and 10 per cent off list
Cut threads ..... 65 and 10 to 70 per cent off list
Longer and larger sizes ..... 65 and 10 to 70 per cent off list
Lag bolts ..... 70 and 10 to 70, 10 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads ..... 60 and 10 per cent off list
Other style heads ..... 20 per cent extra

Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter ..... 65 and 5 per cent off list
Larger and longer sizes ..... 65 per cent off list
Hot pressed sq. or hex. blank nuts ..... $5.50 off list
Hot pressed nuts, tapped ..... $5.00 to $5.25 off list
C.p.c. and t. sq. or hex. blank nuts ..... $5.25 off list
C.p.c. and t. sq. or hex. blank nuts, tapped ..... $5.00 off list

Semi-finished hex. nuts:
⅜ in. to 9/16 in. inclusive ..... 80, 10 and 10 per cent off list
Small sizes S. A. E. ..... 80, 10, 10 and 10 per cent off list
⅝ in. to 1 in. inclusive, U. S. S. and S. A. E.,
70, 10, 10 and 10 per cent off list
Stove bolts in packages ..... 80, 10 and 5 per cent off list
Stove bolts in bulk ..... 80, 10 and 7½ per cent off list
Tire bolts ..... 65, 10 and 10 per cent off list
Track bolts, carloads ..... 3c. to 3.25c. base
Track bolts, less than carloads ..... 4c. to 4.25c.

Upset and Hex. Head Cap Screws

½ in. and under ..... 80 and 10 to 80, 10 and 10 per cent off list
9/16 in. to ¾ in. ..... 80 and 10 to 80, 10 and 10 per cent off list

Upset Set Screws

½ in. and under ..... 80, 10 and 5 to 85 per cent off list
9/16 in. to ¾ in. ..... 80, 10 and 5 to 85 per cent off list

Milled Square and Hex. Cap Screws

All sizes ..... 75 and 10 to 80 per cent off list

Milled Set Screws

All sizes ..... 70, 10 and 10 per cent off list

Rivets

Large structural and ship rivets $2.25
Large boiler rivets 2.35
Small rivets ..... 70, 10 and 10 to 70, 10, 10 and 5 per cent off list

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $36 to $37; chain rods, $36 to $37; screw stock rods, $41 to $42; rivet and bolt rods and other rods of that character, $36 to $37; high carbon rods, $43 to $49, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $2.15 to $2.20 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $2.25 to $2.30 base; 5/16-in., $2.25 to $2.30 base. Boat and barge spikes, $2.25 to $2.30 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, 3c. to 3.25c. base per 100 lb. Tie plates, $2 per 100 lb. Angle bars, $2.40 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $9.30 per package; 8-lb. coating, I. C., $9.60; 15-lb. coating, I. C., $11.80; 20-lb. coating, I. C., $13; 25-lb. coating, I. C., $14.25; 30-lb. coating, I. C., $15.25; 35-lb. coating, I. C., $16.25; 40-lb. coating, I. C., $17.25 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars, 1.40c. to 1.50c. from mill. Refined bar iron, 2c. to 2.10c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	54½	28	¼ to ⅜	+ 3½	+22½
¼ to ⅜	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1½	44½	29½
1 to 3	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6	68	55½	2½ to 6	42¼	29½
7 to 8	65	51½	7 to 12	40½	27½
9 to 12	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜	+ 4½	+37½
¼ to ⅜	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½	44½	30½
1 to 1½	69	57½			
2 to 3	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4	66	54½	2½ to 4	43½	31½
4½ to 6	65	53½	4½ to 6	42¼	30¼
7 to 8	61	47½	7 to 8	35½	23½
9 to 12	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1⅞ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3¼ to 4½ in.	32

To large buyers of steel tubes, a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

New discounts have been adopted on standard commercial seamless boiler tubes, but manufacturers are not yet ready to announce them for publication, and for that reason we publish no discounts this week.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

Cents per Lb.		Cents per Lb.	
No. 8 and heavier	2.20	Nos. 11 and 12	2.30
Nos. 9 and 10 (base)	2.25	Nos. 13 and 14	2.35
		Nos. 15 and 16	2.45

Box Annealed, One Pass Cold Rolled

Cents per Lb.		Cents per Lb.	
Nos. 17 to 21	2.80	No. 28 (base)	3.00
Nos. 22 to 24	2.85	No. 29	3.10
Nos. 25 and 26	2.90	No. 30	3.20
No. 27	2.95		

Galvanized

Cents per Lb.		Cents per Lb.	
Nos. 10 and 11	3.00	Nos. 25 and 26	3.70
Nos. 12 to 14	3.10	No. 27	3.85
Nos. 15 and 16	3.25	No. 28 (base)	4.00
Nos. 17 to 21	3.40	No. 29	4.25
Nos. 22 to 24	3.55	No. 30	4.50

Tin-Mill Black Plate

Cents per Lb.		Cents per Lb.	
Nos. 15 and 16	2.80	No. 28 (base)	3.00
Nos. 17 to 21	2.85	No. 29	3.05
Nos. 22 to 24	2.90	No. 30	3.05
Nos. 25 to 27	2.95	Nos. 30½ and 31	3.10

PERSONAL

S. W. Wheelock has been made manager of sales in St. Louis for Carnegie Steel Co., Illinois Steel Co. and Tennessee Coal, Iron & Railroad Co., to succeed W. W. Scott, Jr., who has become general manager of sales for Laclede Steel Co., St. Louis, Mr. Wheelock was manager of sales for the same companies at New Orleans, and he has been succeeded there by Dennis Crowley, Jr., who has been assistant manager of sales at St. Louis, and he, in turn, has been succeeded by W. W. Arpe, who has been in the St. Louis office for several years. Mr. Wheelock has been engaged in the steel trade since 1893, when he entered the service of the Pittsburgh Tool Steel Co. He was with Park Brothers & Co. from 1893 to 1899, when he went with the Illinois Steel Co. He went with the United States Steel Corporation when it was organized in 1901, and from that year until 1907 was in charge of its Denver office. He was assistant manager of sales at St. Louis from 1907 to 1914, when he was transferred to New Orleans as manager. Mr. Wheelock is a member of the American Iron and Steel Institute.

S. W. WHEELOCK

Chas. E. Sanders has resigned as general purchasing agent of the Emerson-Brantingham Co., manufacturer of farm machinery, Rockford, Ill., effective March 1. After that date he will be associated with his son, Raymond Y. Sanders, in the insurance business at 208 South La Salle Street, Chicago.

At the annual meeting of the stockholders of the Inland Steel Co., Chicago, on Jan. 31, former directors were re-elected and Gordon Battelle, Columbus, Ohio, was elected director to succeed Elias Colbert, deceased. L. E. Block and P. D. Block were re-elected chairman of the board and president respectively. Edward M. Adams was elected first vice-president to succeed G. H. Jones and W. D. Truesdale was elected secretary-treasurer. Other vice-presidents are H. C. Jones, E. J. Block, J. W. Lees, W. C. Carroll and Charles R. Robinson, the latter two having recently become affiliated with the company, as previously announced in these columns.

H. W. Wendt, president of the Buffalo Forge Co., Buffalo Steam Pump Co., Geo. L. Squier Mfg. Co. and Canadian Blower & Forge Co., is on a business trip to South America. Mr. Wendt will visit the principal business centers of South America and expects to be away about four months.

Evan F. Jones, Morgan Construction Co., Worcester, Mass. sails Feb. 14 on the George Washington for a 64 days' trip to the Holy Land and other points of interest.

Frederick G. Hughes, general manager, New Departure Mfg. Co., Bristol, Conn., ball bearings, etc., has been made vice-president of that organization, and Lester G. Signourney, sales department, secretary A. P. Sloan, Jr., vice-president, and John L. Pratt, general manager accessories division General Motors Corporation, have been made New Departure directors.

H. H. Fasnacht, formerly connected with the Shafer Roller Bearing Co., Chicago, has been placed in charge of the engineering sales department of the newly incorporated L. C. Smith Bearings Co., Chicago.

Dr. Eugene Hart, of St. Johns, Mich., was recently elected president of the Triangle Motor Truck Co., that city. F. C. Burk was made treasurer and general manager.

Arthur X. Merz, secretary Madison-Kipp Co., Madison, Wis., sailed Feb. 4 on the Empress of Scotland for a tour of the Mediterranean sea. He will then seek admission to Russia to investigate possibilities of business. The Madison-Kipp Co. is a large producer of automatic lubricating devices for tractors, etc.

A. J. McFarland, general manager, Portsmouth, Ohio works, Wheeling Steel Corporation, has been transferred to the Steubenville, Ohio, works of the company and will assume the position of general manager made vacant by the resignation of G. B. LeVan. G. W. Moore, general superintendent, Portsmouth works, has been promoted to the position of general manager, vice Mr. McFarland.

Carl C. Brown has been appointed vice president and general sales manager of the Nichols Wire & Sheet Co., headquarters Kansas City, Mo. The Nichols company also operate warehouses at Tulsa, Okla., Ft. Scott, Kan., Joplin, Mo., Davenport, Iowa, and Pittsburgh. Mr. Brown was formerly general sales agent of the Gulf States Steel Co., Birmingham, Ala. He is succeeded at Birmingham by Chas. E. Paddock, former sales representative of the company in the southwest, with headquarters at Oklahoma City.

The Gulf States Steel Co. appointed J. H. Bryan sales-agent, with office at 50 Church Street, New York.

William Metcalf, Jr., former president and owner of the Braeburn Steel Co., has been nominated as an alumni trustee of Cornell University, from which he was graduated in 1901.

Edward Van Winkle, who has been associated with F. A. Waldron, as consulting industrial engineer, has re-established himself in the independent practice of patent and trade mark law at 37 Wall Street, New York.

Fred W. Ramsey has resigned the presidency of the Cleveland Metal Products Co., Cleveland, in order to devote more of his time to civic and philanthropic activities. His resignation was accepted at the annual meeting and L. S. Chadwick, who was engineer of the company for nine years and has recently been vice president in charge of manufacturing, was elected in his place. Mr. Ramsey will continue as a director of the company and will devote part of his time to its affairs. He was manager of the recent Community Chest Campaign in Cleveland and has accepted the chairmanship of the Campaign Committee for the next year.

W. F. Jolley, formerly connected with the Troy Wagon Works Co. and later with the Miami Trailer Co., Troy, Ohio, has been appointed by the Holt Mfg. Co., Peoria, Ill., manager of its London office and will have charge of sales of the company's line of tractors in Europe and Africa.

S. S. Chapin has been chosen as secretary and purchasing agent of the American Fork & Hoe Co., Cleveland, succeeding E. D. Lowell, who died recently. Mr. Chapin had been for some time Mr. Lowell's assistant and as such had general charge of the purchasing.

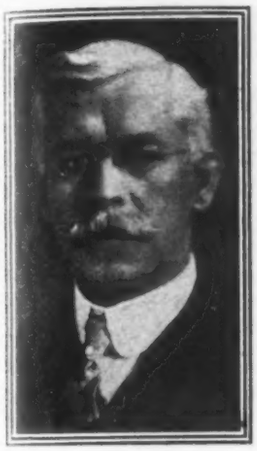
Lincoln Motor Co., Taken Over by Fords

The Lincoln Motor Co., Detroit, was sold at receiver's sale last Saturday, the purchasers being Henry and Edsel Ford, who bid $8,000,000. It is announced that the Lincoln plant will operate immediately with a force of 600 men and production will be speeded. Reductions of from $800 to $1200 will be made in the price of cars. The Lincoln plant will continue to be managed by Henry M. and Wilfred C. Leland.

At the eighteenth annual meeting of the Associated Employers of Indianapolis, Inc., Feb. 16, addresses will be delivered by Walter Drew, New York, counsel National Erectors' Association, and Earl J. McCone, general manager of the Buffalo *Commercial*. "Building and the Public" will be discussed by Mr. Drew and "My Sick Friend, Mr. Itu," will be Mr. McCone's address.

OBITUARY

CHARLES LEWIS TAYLOR, partner of Andrew Carnegie and head of the Carnegie Hero Fund Commission since its creation by Mr. Carnegie in 1904, died at his winter home in Santa Barbara, Cal., Feb. 3. He had been in failing health since last September. He retired from active participation in the iron and steel industry in 1901, with the absorption of the Carnegie Steel Co. by the United States Steel Corporation, at which time he occupied the position of assistant to the president. During the preceding 25 years, Mr. Taylor had an active place in the industry and it is said of him that probably no single individual connected with the steel industry between 1880 and 1890 did more in the practical direction of supplanting wrought iron with soft steel than he did. His thorough knowledge of chemistry and the metallurgy of steel enabled him while superintendent of the Homestead Steel Works to be probably the first one to successfully produce soft steel for manufacture of pipe, nails, ship plate and structural steel. His early connection with the designing as well as the manfacture of steel suitable for steel car construction, was one of his principal achievements, representing pioneer work of an original character and a comprehensive foresight into the requirements of the steel business. Since his retirement from active business, Mr. Taylor had devoted his time principally to philanthropic work, partly of a personal nature and partly in behalf of the pension and relief organizations in which he was associated. He was first chairman of the Carnegie Pension Fund, which now is administered as the United States Steel and the Carnegie Pension Fund. He was born in Philadelphia, April 3, 1857, a son of John D. Taylor, treasurer of Pennsylvania Railroad Co. from 1874 to 1886. He was graduated from Lehigh University in 1876 with the degree of mechanical engineer and immediately after graduation became assistant chemist at the works of the Cambria Iron Co., Johnstown, Pa. He subsequently became assistant superintendent of blast furnaces at that plant. He went to Pittsburgh in 1880 to become chemist for the Pittsburgh Bessemer Steel Co., and in 1882 became superintendent of the company, retaining this position until the company was merged into the Carnegie interests. From 1883 until 1887 he was superintendent of the Homestead Steel Works, his successor being Charles M. Schwab, now chairman of Bethlehem Steel Corporation. The next two years he was general manager of Hartman Steel Co., another Carnegie plant, and from 1890 to 1892 he was assistant secretary of Carnegie, Phipps & Co., Ltd. In 1893 he was made assistant to the president, Carnegie Steel Co., with general supervision over the operations of all works, holding this position until his retirement in 1901.



CHARLES L. TAYLOR

ARTHUR BOSTWICK, president and one of the founders of the International Nickel Co., died at his home in Lawrence Park, West Bronxville, N. Y., Feb. 4. He was 48 years old and for a number of years resided in Pittsburgh, going to that city in 1898, following his graduation from the Columbia University School of Metallurgy, to become metallurgist at the Homestead works of the Carnegie Steel Co. In 1903 he became chief metallurgist of that company. A few years later, in association with Ambrose Monell and E. T. Wood, he helped in the organization of the International Nickel Co., becoming assistant to Mr. Monell, the president, in 1911 and advancing to the presidency in 1915. He was a member of the American Society for Testing Materials, the American Society of Mining and Metallurgical Engineers and the American Iron and Steel Institute.

ARTHUR L. OVER, secretary of the Columbia Steel & Shafting Co., Pittsburgh, since its inception in 1899, died at his home in Ben Avon, Pa., Feb. 5, following a brief illness. He was 46 years old and was graduated from the University of Pittsburgh, in both the academic and law departments, completing the latter course in 1897. He was admitted to the Allegheny County bar that year and had practiced law since, beside attending to his business connections.

EPHRAIM TRUSALL, at one time manager of the Sligo rolling mills of Phillips, Nimick & Co., Pittsburgh, and of the Wheatland Iron Mills, Wheatland, Pa., died at his home in Pittsburgh Feb. 3. He was born in Westmoreland County, Pa., 70 years ago.

ALBERT R. WARNER, a director of the White Co., Cleveland, and secretary and treasurer of that company until his retirement from active business life several months ago, died Jan. 26, aged 54 years. His death resulted from a stroke of paralysis.

COLGATE HOYT, of Colgate Hoyt & Co., New York bankers, who died Jan. 30, was quite prominently identified with the Great Lakes shipping industry years ago before he moved from Cleveland to New York. He was associated with Alexander MacDougall, Duluth, in building and operating the type of boats known as whalebacks used for a number of years in the ore carrying trade. He was a brother of the late James H. Hoyt, a prominent Cleveland attorney who represented large lake vessel and iron and steel interests.

AARON B. HILER, for the past 15 years sales representative in the East and a part of the South for the Jones & Lamson Machine Co., Springfield, Vt., died on Jan. 29 at his home, 235 North Center Street, Orange, N. J. The funeral was held Monday evening and burial took place at Rockaway, N. J. Mr. Hiler was one of the best known machine-tool salesmen in the country. For some years he had been in poor health, but until a few weeks ago was active in his occupation.

MOSES MOSLER, aged 71 years, president of the Mosler Safe Co., Hamilton, Ohio, died at Grand Canyon, Arizona, on Jan. 19, while en route to the Pacific Coast on a pleasure trip. Mr. Mosler was the last of five brothers who were prominent in the business and professional life of Cincinnati. The Mosler Safe Works, of which he was the head, is the largest of the kind in the world, and employs more than 1000 persons. He is survived by his wife and one daughter, Mrs. E. C. Hyman, wife of the vice-president and treasurer of the company.

ALBERT C. ASHTON, treasurer Ashton Valve Co., Cambridge, Mass., died recently at St. Petersburg, Fla. He was born in England 52 years ago, but educated in this country, being a graduate of the Massachusetts Institute of Technology. Mr. Ashton was affiliated with many societies, including the American Society of Mechanical Engineers.

ARTHUR LEWIS, general sales manager the Great Western Smelting & Refining Co., Chicago, committed suicide at the home of his brother in Seattle, Wash., on Feb. 3. Mr. Lewis, who was 38 years of age, had suffered a nervous break-down.

The following production figures for December, 1921, in metric tons, have been issued by the Belgian Mining Administration, according to Acting Commercial Attaché S. H. Cross, of Brussels: Pig iron, 74,150: raw steel, 60,900; rough steel castings, 360; finished steel, 78,120; finished iron, 16,560; spelter, 7,370; coal, 1,965,350.

Machinery Markets and News of the Works

IMPROVEMENT CONTINUES

Activity in Small Tools Believed to Portend Sales of Heavier Equipment

Some Fair Sized Lists and Numerous Single Machine Inquiries Reported

In almost every quarter, the trend toward improvement in machine-tool inquiries and sales has been sustained. Settlement of the political situation in the Far East is expected to result in an increase of exports. There is a prevalence of small tool orders in practically all markets, which is believed to portend purchases of heavier equipment. One company in the New England district reports January sales of small tools as larger than at any time during the previous six months.

One of the districts showing the greatest activity is Cleveland, where several manufacturers have come into the market for automatic screw machines, the largest reported calling for between 60 and 75 machines. Other inquiries in this market include planers, turret lathes, vertical boring machine, and equipment for motor-valve stem manufacturer. For the first time in months inquiry is reported from the Akron, Ohio, rubber industry. Some manufacturers, who recently had surplus machinery for sale, have withdrawn offers, in view of the improved outlook. One manufacturer of automatic screw machinery has reduced prices about 25 per cent.

Numerous orders are reported by Cincinnati builders, shapers, grinding machines of special type, boring mills, planers, engine lathes and drilling machines being included. Inquiries for single machines are numerous and a fair percentage is developing into orders. The Hocking Valley Railroad Co. has issued a list calling for seven heavy-duty tools.

Although bookings in the New England district have been light, there is considerable optimism as to future purchases, which, it is believed, cannot be delayed much longer. Inquiry at present seems to be confined largely to used equipment. Negotiations are in progress for the purchase of 20 lathes, ranging in size up to 36-in. One of the largest active inquiries calls for 16 lathes, two planers, two drilling machines, a milling machine, shaper, floor-boring equipment, wet tool grinder and key-seater. Other prospective closings are on pipe machines, punches and shears, and numerous small tools. There is some activity in abrasive wheels.

Less activity was evident in the Pittsburgh district, although sales were slightly better than at any time in January. Some fair sized orders are noted. The Wheeling Steel Corporation is asking for 20 tools for its Portsmouth, Ohio, plant; another list is expected for Steubensville, Ohio. Buying is evidently affected to a certain extent by the prospect of reduced freight rates.

The quietest market during the week was Chicago. As in other centers, single machine inquiries and an inclination to consider used equipment was notable. Western railroads are still delaying action on their lists. The Sante Fe continues to add items to its pending inquiry and is now asking for a power-driven band saw and a wood-working machine. The Erie Railroad and the Illinois Central have placed orders.

New York

NEW YORK, Feb. 7.

Few orders were reported this week in the crane market. Several new inquiries have appeared, however, and several inquiries that have been in the market for some time are extremely active and may be closed within the next week. The inquiry of the Lamson Co., Boston Mass., is again active. Among recent inquiries is one from Stone & Webster, Boston, for a 10-ton and 15-ton overhead traveling crane with alternate specifications, for the Ford plant at Green Island. The Phoenix Utilities Co., New York, which inquired for prices on a 40-ton, 50-ton and 60-ton crane, hand power and one motor with electric hoists, has decided to purchase the 60-ton crane. Bidding to J. E. Woodwell, consulting engineer, 501 Fifth Avenue, New York, on the 75-ton, 66-ft. 4-in. span, 4-motor, overhead traveling crane for a power house in Lansing, Mich., resulted in a low bid of $15,050 by the Whiting Corporation, $15,280 by the Milwaukee Electric Crane & Mfg. Co., and $15,545 by Manning, Maxwell & Moore, Inc.

Among recent sales were three small cranes sold by the Whiting Corporation to S. Firestone, consulting engineer, Rochester, N. Y., for a new plant of the Aetna-Portland Cement Co., at Essexville, Mich. The Industrial Works sold a 30-ton, 50-ft. boom locomotive crane with grab bucket to the Aetna-Portland Cement Co.

The Max Schaffer Co., 26 Warren Street, New York, manufacturer of gas lighting and burning equipment and supplies, will soon take bids for a top addition to its eight-story plant, 75 x 100 ft., at 31-33 West Fifteenth Street, including improvements in the present factory, estimated to cost $90,000. Maurice Courland, 47 West Thirty-fourth Street is architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Feb. 21, for one surface condenser, for the navy yard at Iona Island, N. Y.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, has made application for permission to issue bonds or stock to an amount of $10,000,000, a portion of the proceeds to be used for a new power plant on Sixty-sixth Street, estimated to cost in excess of $500,000. It will be 80 x 130 ft.

The Cutting Larson Co., 109 West Sixty-fourth Street, New York, representing the Oldsmobile Co., has awarded contract to the Barney-Ahlers Co., 110 West Fortieth Street, for a six-story automobile service and repair works, 100 x 120 ft., on Sixty-sixth Street, estimated to cost $200,000.

The Erie Railroad Co., 50 Church Street, New York, has leased its car repair shops at Buffalo, N. Y., to the Seminole Construction Co., Buffalo, headed by William H. Fitzpatrick, which will operate the plant for contract work for the road. Operations were commenced on Feb. 6, maintaining the present working force. The railroad company is arranging, also, for a lease of its shops at Salamanca, N. Y., to a private operating company. The company has signed a lease with the Youngstown Equipment Co., Youngstown, Ohio, for the operation of its car shops at Brier Hill, Ohio, and locomotive shops at Kent, Ohio.

The Adirondack Power & Light Corporation, Amsterdam, N. Y., has arranged an appropriation of $1,000,000, for the installation of new equipment at its plant, comprising a 20,000-hp. generator and auxiliary machinery. Charles S. Ruffner is first vice-president and general manager.

Fred L. Brown, Locust Street, Hudson Falls, N. Y., will commence the immediate erection of a two-story automobile service and machine repair building, 70 x 100 ft. The H. P. Cummings Construction Co., Colvin Building, Glen Falls, N. Y., is the contractor.

A one-story automobile service and repair works for company cars will be constructed by the Willow Brook Dairy Co., 5 South Fulton Street, Mount Vernon, N. Y., in connection with the erection of its new local plant, con-

tract for which has been awarded to the Barney-Ahlers Co., 110 West Fortieth Street, New York, estimated to cost $200,000.

The Savage Arms Corporation, 50 Church Street, New York, with plants at Utica, N. Y., and Philadelphia, is arranging its works for a new line of production to include refrigerating machinery and parts, and electrically operated washing machines.

The Radio Mfg. Co., 170 Fifth Avenue, New York, has leased property at 251 Fourth Avenue, for local works.

Fire, Feb. 3, destroyed a machine shop and other buildings at the locomotive shops of the Lehigh Valley Railroad Co., Jersey City, N. J., with loss reported in excess of $50,000, including equipment.

The Tide Water Oil Co., 11 Broadway, New York, is completing plans for a new one-story works building, 35 x 60 ft., on Lyons Avenue, Irvington, N. J., to cost about $25,000. Bids will be asked early in April.

A vocational department will be installed in the three-story high school to be constructed at Asbury Park, N. J., estimated to cost about $400,000. E. F. Arend, 105 West Fortieth Street, New York, is architect and engineer.

Power equipment and other mechanical apparatus will be installed in the new two-story factory of the American Book Co., 100 Washington Square, East, New York, at Watsessing and Bloomfield avenues, Bloomfield, N. J., ground for which has been broken by the Austin Co., 217 Broadway, New York, contractor, estimated to cost about $200,000.

The Ford Motor Co., Lincoln Highway, Kearny, N. J., will commence the immediate rebuilding of the portion of its local assembling plant, destroyed by fire, Feb. 1, with loss reported at $250,000, including equipment. The japanning and other departments were partially destroyed.

A vocational department will be installed in the new four-story high school to be erected at Hightstown, N. J., estimated to cost about $150,000. Guilbert & Betelle, 685 Broad Street, Newark, N. J., architects, are preparing preliminary plans.

An ordinance covering the vacating of property in the vicinity of the plant of the Standard Underground Cable Co., Perth Amboy, N. J., passed recently by the Board of Alderman to permit the erection of additions, has been annulled by the State Supreme Court on the grounds of unreasonable exercise of municipal power, and the proposed extensions, estimated to cost about $200,000, will be held in temporary abeyance.

An electric power plant, machine and other vocational shops will be installed in the four-story junior high school, 117 x 345 ft., to be erected at First Avenue and Loomis Street, Elizabeth, N. J., contract for which has just been awarded to H. Wilhelms Sons, Inc., 803 East Jersey Street, Elizabeth, contractor, estimated to cost $580,000. C. Godfrey Poggi, 275 Morris Avenue, Elizabeth, is architect.

Officials of the Public Service Corporation, Public Service Terminal, Newark, have organized a subsidiary company, the Public Service Production Co., capitalized at $5,000,000, to engage in engineering and construction enterprises. A feature of the work will be electric power plant construction and steam railroad electrification. Negotiations are said to be under way with the Lackawanna Railroad for extensive work of the latter character. Thomas N. McCarter, president of the parent company and other operating subsidiaries, will head the new organization. Nathaniel A. Carle, chief engineer for the Public Service Electric Co., will be vice-president and general manager.

The Solar Light Co., 69 Wooster Street, New York, manufacturer of nitrogen high power lamps, etc., has leased a portion of the building at 24 Mechanic Street, Newark, for a branch plant. Possession will be taken at once and necessary equipment installed. Joseph Blum is secretary.

A machine shop for automobile service and repair work will be installed in the new building to be erected at 9-11 New Jersey Railroad Avenue, Newark, for the Black & White Taxi Co., now located at 9 New Jersey Railroad Avenue. It will be one-story, 50 x 125 ft.

The Morse-Rogers Steel Co., Cleveland, advises that for the past three years it has had an Eastern warehouse and office in Newark, but owing to the fact that it required larger quarters, space has been leased in the new Shupe Terminal plant at Lincoln Highway and the Passaic River.

Export Trade Opportunities

The Societe Anonyme des Automobiles Excelsior, Savanthem, Belgium, would like to hear from manufacturers of gang drills and boring machines suitable for making 6-cylinder automobile engines.

Ernst Gleitzmann & Co., Postoffice Box No. 73, Libau, Latvia, advise THE IRON AGE that they desire to represent American manufacturers of machine tools and small tools in Latvia and Russia. They write that they are in touch with all of the largest buyers in Latvia and Russia and are in a position to close some business. Catalogs and price lists are requested.

Buffalo

BUFFALO, Feb. 6.

The Joseph Schonthal Co., Buttles and Michigan avenues, Columbus, Ohio, scrap metals, has acquired the plant and business of the American Foreign Steel Co., Ingham Avenue, Buffalo, devoted to a similar line of operation, and will take immediate possession. The purchase includes all equipment, including cranes, scrap breaking machinery, etc., as well as about 5½ acres for future expansion. The consideration is said to be $80,000. Joseph Neeb, heretofore local manager at the plant, will continue in the same capacity for the new owner.

Fire, Jan. 29, destroyed a portion of the car shops of the New York Central Railroad Co., Grand Central Terminal, New York, at Lyons, N. Y., with loss estimated at close to $30,000.

A vocational department will be installed in the new high school to be constructed at Owego, N. Y., George S. Decker, president, estimated to cost about $250,000. Preliminary plans are being prepared by Coffin & Coffin, 522 Fifth Avenue, New York, architects.

Negotiations are under way for the purchase of the plant and property of the Lamoka Electric Water & Power Corporation, Corning, N. Y., by W. P. Gannon, 103 South Avenue, Syracuse, N. Y., and associates. The purchasing interests will maintain the present company and operations, and plan for the construction of a hydroelectric generating plant on Lake Lamoka with initial capacity of approximately 35,000 hp. to be used in conjunction with the present system.

The Oswego Falls Corporation, Fulton, N. Y., has been organized with a capital of $2,500,000 to take over and consolidate the plants and businesses of the Oswego Falls Pulp & Paper Corporation, Fulton, and the Skaneateles Paper Co. and the Seal Right Co., Inc., both of Skaneateles. The merged company will operate three mills at the two places noted, and has preliminary plans under consideration for general expansion. For this latter purpose and general financing a bond issue of $2,100,000 has been sold. H. L. Paddock is president.

Chicago

Chicago, Feb. 6.

The past week has been a quiet one in the local machine tool market, although a few sales of large machines have been closed. Large industrial companies which are normally large purchasers of machine tools are not active in the market and Western railroads are still delaying action on their lists. Inquiries for single machines from widely distributed sources are still the rule and in many cases these prospects are uncovered only after a thorough canvass by the sales forces of local machinery houses. There continues to be a certain amount of shopping in the local district, but in most cases prospective buyers are looking for bargains, showing a preference for used equipment or demonstration machines.

Among recent orders placed may be mentioned a used 60-in. boring mill and a 36-in. x 36-in. x 8-ft. open-side planer bought by the A. Y. McDonald Mfg. Co., Dubuque, Iowa. The Erie Railroad has placed an order for two No. 2 Niles axle lathes with the David A. Wright Machinery Co., Chicago. A 25-in. shaper has been purchased by the Illinois Central. The Santa Fe continues to add a few items to its pending list from time to time, the latest additions being one Atkins No. 7 power-driven band saw or equivalent, and one Fay & Egan No. 62, or equivalent, universal wood-working machine, arranged for belt drive. Among other small inquiries recently received are the following: Wichita Northwestern Railway Co., Hutchinson, Kan., one used 36-in. x 6-ft. engine lathe, one used air compressor with 8-in. bore, 6-in. stroke, and generating not less than 100 lb. pressure per sq. in., and one used 1½-in. bolt cutter; New Ulm Mfg. Co., New Ulm, Minn., a used centerless grinder and a small milling machine; Marinette Iron Works, Marinette, Wis., a used Acme 1¼-in. single bolt cutter; Steel Sign Service Co., Decatur, Mich., a used iron bottom folder, with a capacity for 24-gage sheets.

The Dwyer Equipment Co., 9 West Kinzie Street, Chicago, manufacturer of "Twinfan" ventilating heating units, has let contract for a one-story plant, 60 x 125-ft., at 4534 North Avenue, to cost $15,000.

Michaelson & Rognstad, architects, 3315 West Congress Street, Chicago, are preparing plans for a one-story foundry and machine shop, 80 x 144 ft., for the west side, to cost $60,000. The architects will receive bids in about two weeks

when the identity of the company for which the plant is to be built will be disclosed. The same architects have received bids on a three-story automobile building and repair station, 25 x 110 ft., 2452 South Michigan Avenue, for Landrey & Maypole, 2440 South Michigan Avenue. It will cost $40,000.

Orlando Van Dunten, architect, 800 North Clark Street, Chicago, is receiving bids on a two-story automobile and machine repair shop, 42 x 82 ft., at Howard Avenue and North Clark Street, for R. Johnstone, to cost $20,000.

L. G. Hallberg & Co., architects, 116 South Michigan Avenue, Chicago, are receiving bids on a two-story factory, 100 x 100 ft., on Western Avenue, for the David J. Malloy Co., book binders, 633 Plymouth Court, at a cost of $100,000.

The Western Electric Co., Hawthorne, Ill., is having plans drawn for a four-story factory for the manufacture of packing material.

The General Die Casting Co., recently incorporated with $25,000 capital stock by M. C. Duhr, J. G. Turner and D. C. Robson, will manufacture die castings in standard and special alloys. It has leased a plant at 2533-2539 North Ashland Avenue, Chicago, and its initial equipment will comprise 12 die casting machines and necessary appliances.

The Public Service Co. of Northern Illinois, 72 West Adams Street, Chicago, proposes to erect a power plant with a capacity of 200,000 kw. on a site of 87 acres which it has acquired near Waukegan, Ill.

The Chicago Grain Products Co., manufacturer of grain alcohol, has started the erection of a power plant in connection with its distillery at Rockford, Ill., to cost $102,000.

The Central Illinois Public Service Co. is preparing plans for a new power plant at Grand Tower, in Jackson County, Ill., with an initial capacity of 30,000 kw. It also proposes to increase the capacity of its Harrisburg, Ill., plant to 30,000 kw.

The Casey-Hudson Co., manufacturer of screw machine products, 361 East Ohio Street, Chicago, will move to Chelsea, Mich., where it will occupy a foundry and power plant purchased from the Lewis Spring & Axle Co.

The Power plant of the Wood Lake Electric Co., Wood Lake, Neb., was recently destroyed by fire with a loss estimated at $5,000.

The Peoria Auto Parts Co., Peoria, Ill., is having plans prepared for a new two-story works, 60 x 100 ft., to cost about $100,000, including equipment. B. L. Hulsebus, Jefferson Building, is architect.

The Woodmanse Mfg. Co., 10 Galena Street, Freeport, Ill., manufacturer of pumps, windmills, etc., is planning for the erection of a new two-story addition estimated to cost about $35,000.

The Office of the Purchasing Agent, Post Office Department, Washington, will receive bids until Feb. 20 for six electric tractors, 400 trailers, and 1200 combination balance trucks and trailers for use at the Chicago post office.

The Board of Education, Lincoln, Neb., has commissioned Fiske & Meginnis, architects, 533 Bankers' Life Building, to prepare plans for a one-story vocational shop for use in connection with the city high school, estimated to cost about $125,000, including equipment. J. G. Ludlam is secretary of the board.

The Farmers' Terminal Packing Co., 920 Commerce Building, St. Paul, Minn., has plans under way for a one-story ice-manufacturing plant, 100 x 100 ft., estimated to cost about $60,000. Bids will be asked early in the spring. The Newstrom-Lindquist Co., 810 Lumber Exchange Building, Minneapolis, Minn., is architect.

A vocational department will be installed in the two-story high school to be erected at Clarkfield, Minn., estimated to cost about $100,000. Bids will be called early in March. Prins, Buckley & Ross, Palace Building, Minneapolis, Minn., are architects.

A vocational department will be installed in the three-story and basement high school to be erected by the Board of Education, State Center, Iowa, estimated to cost about $135,000. Plans are being prepared by H. E. Reimer, architect, Kibby Building, Marshalltown, Iowa.

Detroit

DETROIT, Feb. 6.

At a recent meeting of the Northern Wheel Co., Alma, Mich., plans were outlined for taking over the plant of Bollstrom Motors, Inc., St. Louis, Mich. The plan proposes increasing the common stock of the wheel company by $250,000 to purchase the Bollstrom plant and add new equipment to manufacture automobile wheels.

The Anchor Concrete Machinery Co., Rock Rapids, Iowa, has moved to Adrian, Mich., and incorporated for $100,000. The plant and site of the Adrian Steel Castings Co. have been purchased and machines for producing blocks, bricks and cement will be made.

The Alamo Heating Co. and the Gray Iron Foundry Co., both of Muskegon, Mich., which have been working on a partnership agreement for the past year in the manufacture of furnaces and other foundry and machine products, have formed a new corporation, capitalized at $100,000, to operate under the name of the Gray Iron Foundry & Furnace Co.

The Cyclone Motors Co., maker of motorcycles, which recently announced that it would locate in Benton Harbor, and which is headed by John M. Eaton, long associated with the Lincoln Motors, has entered into a contract to buy the plant of the Peninsular Lumber Co., Benton Harbor.

The Brunswick, Balke, Collender Co., Chicago, will locate its entire facilities for the manufacture of phonograph record disks at the present phonograph plant in Muskegon, Mich. About 300 more men will be added to the working force at Muskegon.

The Lincoln Mfg. Co., Detroit, will build an addition in the spring. It will be three stories, 30 x 115 ft., and will cost $100,000. The company manufactures electric lighting fixtures.

The Victor Screw Works, Inc., and the Peninsular Milled Screw Co., both of Detroit, have been merged under the name of the Victor-Peninsular Co. The consolidated organization will occupy a new plant at Lawton and Hancock streets and will manufacture a complete line of machine screws and other threaded machine products.

Fire, Jan. 24, destroyed a portion of the plant of the Barnes Wire Fence Co., Detroit, with loss estimated at about $65,000, including equipment. The works of the Selik Brothers Machine Co., also, were partially destroyed, with loss approximating $23,000.

The Grand Rapids Metal Products Co., 1530 Monroe Avenue, N. W., Grand Rapids, Mich., is planning for the installation of a new drill press and other machine tool equipment.

The Cadillac Tool Co., Detroit, has decided to dissolve, and accordingly this dissolution is going on. A new concern to take its place in the territory of the old company has just been incorporated under the name of the Cadillac Machinery Co. and will have the old personnel of the Cadillac Tool Co., which were engaged in the sale of machine tools. The new concern will not do any manufacturing, as did the old, but will devote its entire efforts to the sale of machine tools. The personnel of the Cadillac Machinery Co. will consist of C. L. Campbell, C. E. French, L. E. Bugbee, C. G. Valentine, and R. J. Borneman, and the same territory will be covered as previously covered by the Cadillac Tool Co. The wish of Mr. Fowl, the former president, as expressed in his will, was that the men associated with him in the Cadillac Tool Co. should continue to be interested in carrying on the business which he started. The result is that at the dissolution of the Cadillac Tool Co. the Cadillac Machinery Co. has been formed. Its sales room is located at the corner of East Lafayette and Beaubien streets.

Philadelphia

PHILADELPHIA, Feb. 6.

The Bureau of Supplies and Accounts, Navy Department, Washington, is taking bids under schedule 9416 for one shearing machine, one cutting machine and power press, until Feb. 21, for use at the Philadelphia Navy Yard.

The Reading Hardware Co., 816 Arch Street, Philadelphia, manufacturer of hardware and metal specialties, with plant at Reading, Pa., has acquired the property of the Haverford Cycle Co., 9 North Street, 25 x 114 ft., for its local branch.

Fire, Jan. 29, completely destroyed the box plant of Clements Brothers, Delaware Avenue and Water Street, Philadelphia, with loss estimated at close to $70,000, including woodworking and other machinery.

The Wayne Oil Tank & Pump Co., 112 North Broad Street, Philadelphia, with plant on Canal Street, Ft. Wayne, Ind., has leased the new building to be erected at Broad Street and the Richmond branch of the Philadelphia & Reading Railroad for a local factory branch.

The Bureau of Water, City Hall, Philadelphia, is having plans prepared for a one-story machine shop and automobile service works, 100 x 160 ft., at Twenty-eighth and Cambria streets, estimated to cost about $60,000.

A vocational department will be installed in the new junior high school buildings to be erected by the Board of Education, Philadelphia, consisting of three schools, at Twenty-fourth and Jackson streets; Fifty-fourth and Warrington streets, and at Thirteenth and Louden streets, respectively. A fund of $2,000,000 is being arranged.

J. M. White, 1116 Olive Street, Philadelphia, manufacturer of wire products, has awarded contract to Frank I. Wintz, 1618 North Twenty-seventh Street, for a two-story and basement addition, 60 x 95 ft., adjoining the present works, estimated to cost about $25,000. Wire braiding and other machinery will be installed.

The John E. Thropp's Sons Co., Lewis Street, Trenton, N. J., manufacturer of rubber-working machinery, has organized the Hendrie Rubber Tire Co., capitalized at $200,000 under State laws, to take over and operate the plant of the Hendrie Rubber Co., Torrance, Cal. The plant will be arranged to develop a capacity of 350 tires and 200 tubes per day. The new company is headed by Thomas H. Thropp, president and general manager; Peter D. Thropp, vice-president; John E. Thropp, secretary; and William Baker, treasurer. The last noted will take up a residence at Los Angeles and be in charge of operations.

Fire, Jan. 27, destroyed a portion of the ice-manufacturing plant of the American Ice Co., Philadelphia, at Atlantic City, N. J., with loss estimated at about $60,000. The company has just broken ground for the erection of a one-story and basement addition, 44 x 149 ft., at Arctic and Michigan avenues.

A vocational department will be installed in the three-story and basement, 130 x 165 ft., senior and junior high school, to be erected at Wayne by the Radner Township School District, Joseph C. Egbert, secretary, 115 North Wayne Avenue, Wayne, Pa., estimated to cost about $150,000. H. C. Richards, 608 Chestnut Street, Philadelphia, is architect.

The Freed Heater Co., Collegeville, Pa., manufacturer of heating equipment, iron castings, etc., is planning for enlargements, with new equipment. The company is now giving employment to about 60 core makers, molders and machinists. A capital stock issue totaling $100,000 is being arranged to provide funds for the expansion.

The United Ice & Coal Co., Forster and Cowden streets, Harrisburg, Pa., will soon call for bids for its new one-story ice-manufacturing and refrigerating plant, 60 x 150 ft., at Seventh and Schuylkill streets, estimated to cost about $150,000. It will have an initial daily capacity of about 100 tons. Mahlow Miller is head.

The East Penn Foundry Co., Macungie, Pa., has enlargements in its plant under way. New equipment for brass casting and other manufacture will be installed.

The Nilco Lamp Works, Inc., Emporium, Pa., has been chartered under State laws with capital of $100,000 to manufacture electric lamps, operating at the former plants of the General Electric Co., at Emporium and St. Marys, Pa., recently acquired. B. G. Erskine is president, and Guy S. Felt, treasurer.

The Butler Automotive Steel Co., Easton, Pa., recently organized, has taken over the local plant and business of the Butler-Edwards Electric Co. Operations will be devoted to the manufacture of automobile parts and affiliated steel specialties, and the line of electrical equipment heretofore produced will be discontinued.

James & Son, Plymouth, Pa., manufacturers of mine drills and kindred equipment, have consolidated with the Bittenbeader-Legrand Mine Drill Works, Barney Street, Wilkes-Barre, Pa., manufacturer of similar equipment. The present Plymouth works will be removed to Edwardsville, Pa.

Claude V. Brong, 524 Linden Street, Allentown, Pa., operating a mechanical and vulcanizing shop, is planning for the installation of a new department to manufacture storage battery equipment and for general electric battery repair work.

Cleveland

CLEVELAND, Feb. 6.

Machine tool orders show some gain and there is a marked increase in the number of inquiries, some of which are for round lots of tools. While a few of the larger inquiries are regarded as tentative, they indicate that machinery users are at least considering the buying of equipment. Several inquiries have come out for automatic screw machines. One is a tentative inquiry from a manufacturer of electrical equipment for 60 to 75 machines. Another is from an automobile manufacturer for 15 machines and a third from a locomotive plant for four to six machines. A Michigan automobile manufacturer is contemplating the purchase of from 15 to 20 planers to replace present equipment. A Detroit plant is figuring on the purchase of machine tool equipment for making 25,000 motor valve stems per day. A Battle Creek, Mich., manufacturer is reported to be in the market for three turret lathes.

Locally an improvement in single tool orders is noted, much of this business coming from makers of various specialties and some from manufacturers of automobile accessories. One dealer took an order for a lathe for shipment by express from the factory. Cases are reported where manufacturers have withdrawn from the market some machinery that they had offered for sale, advising the trade that with improvement in the outlook they may have use for the machines. For the first time in months a little machine tool business is coming from the Akron rubber industry. The Herbrand Co., Fremont, placed orders for a 1200-lb. and a 1500-lb. board drop hammer to replace present equipment. A Cleveland foundry and machine shop is inquiring for a 10-ft. vertical boring machine with extensions providing a 16-ft. swing.

The National Acme Co., Cleveland, has announced price reductions on its line of automatic screw machinery effective Feb. 1. These vary on different types of machines, but average approximately 25 per cent.

The Wright Mfg. Co., Lisbon, Ohio, has taken up the manufacture of automobile pistons in connection with its regular line of chain hoists, trolleys and cranes.

The Palmer Match Co., Kenmore, Ohio, recently incorporated with a capital stock of $5,000,000, will receive bids shortly for its proposed new plant.

The W. W. Sly Mfg. Co., Cleveland, has taken a contract for sand blast equipment for the Detroit plant of the American Car & Foundry Co. This equipment is designed for cleaning four freight cars at a time.

The Vervoort Ball Bearing Co., East Eighteenth Street, Cleveland, has taken over the Superior Roller Bearing Co., formerly located in Canton, Ohio. Officers have been elected as follows: President, J. T. Koepke; vice-president, J. V. Zupnik; secretary and general manager, Henry G. Tremmel; treasurer, F. W. Watson. The company is building a new plant which will be completed in the spring.

The Kerscher Brothers Machinery Co., 915 Ontario Street, Toledo, Ohio, manufacturer of hydraulic and electrically operated freight and passenger elevators, has completed plans for a one-story addition, 75 x 150 ft. George J. Kerscher is president.

A vocational department will be installed in the new two-story high school to be erected by the Board of Education, Westerville, Ohio, estimated to cost about $190,000. Glass & Austin, Gasco Building, Columbus, Ohio, are architects.

New England

BOSTON, Feb. 6.

There is considerable machine tool prospective business in this territory, but it is maturing slowly. A week ago it was generally anticipated in local circles that a good amount of business would be booked by now, but results have been disappointing. Additional prospects have come to light since then, largely from small and unimportant interests, involving one, two or three pieces of equipment, and generally used machinery. The local trade, at least, has not lost its enthusiasm and cheerfulness, however, and believes that purchases cannot be delayed much longer.

Among sales the past week were one 16-in. x 6-ft. lathe, and one 9-in. x 3-ft. tool bought by two separate local concerns; two 9-in. x 4-ft. lathes to a greater Boston automobile service station; one 24-in. x 10-ft. lathe to Worcester interests; special grinding production equipment to Gray & Davis, Cambridge, Mass., lighting and starting systems; special boring machine, costing $12,000, to another Cambridge manufacturer, and a 16-in. x 10-ft. toolroom lathe to the Hood Rubber Co., Watertown, Mass. Possibly 20 other lathes, including some 36-in. tools, are under negotiation. Competition for lathe business is keen, and prices naturally are in the buyer's favor.

The H. B. Smith Co., Westfield, Mass., inquiry includes one 18-in., one 20-in. and 14 plain turning lathes; one 72-in. and one 30-in. planer; one No. 6 Becker vertical milling machine, one 4-ft. radial drill; one 32-in. upright drill, one 24-in. shaper, floor boring equipment, a wet tool grinder, and a keyseater. The Lamson Co., Boston, is inquiring for three pipe working machines, a gate shear, double angle shear, double end punch and shear, and miscellaneous smaller equipment for its new Rochester, N. Y., plant. In both instances these concerns are planning to take at least some used equipment. The New England Oil Refining Co. has a small list of shop equipment needed for a Rhode Island plant. The Boston & Albany Railroad is inquiring for brass work lathe equipment, and a Worcester concern for shaper and lathe requirements.

One of the most encouraging features in the New England machine-tool industry is the greater activity in small tools, which generally is indicative of increased bookings on heavier equipment. At least one company reports January sales of small tools as larger than in any previous six months. Other representatives of machine tool builders note a larger movement of small equipment out of stock.

In line with this information is a decidedly better inquiry for abrasive wheels, the demand, however running more to

the smaller than the larger sizes. In contrast, it may be said that probably no branch of the machine tool industry is less active than the grinding machine. The increased call for small abrasive wheels would therefore indicate more activity in small machine shops. The market on drills and reamers is unsettled, due to the wide variety in prices for and origin of stock offered.

Excavating has begun for a one-story, 60 x 65 ft. machine shop to be erected in Nathan Place, Lynn, by George T. Covert, Spring Street.

The Fales & Jenks Machine Co., Pawtucket, R. I., has purchased land adjoining its plant on Dexter and Barton streets, on which an addition is contemplated at some future date.

The Fall River Gas Works Co., Fall River, Mass., will erect a one-story, 26 x 42 ft. boiler house. John J. Dillion, 24 Manton street, will supervise the construction.

The George Grow Tire Co., Canton, Mass., contemplates the erection of an addition to cost approximately $25,000.

The plant occupied by Stone & Murphy, Middletown, Conn., automobile accessories, last week was badly damaged by fire. It will be rebuilt.

The R. H. Long Co., Framingham, Mass., automobiles, has leased for a long term of years, 30,000 sq. ft. of floor space at 846 Commonwealth Avenue, Boston, as a show room and service station.

Fire, Feb. 1, in the finishing and etching department of the Lamson & Goodnow Co., Shelburne Falls, Mass., maker of cutlery, burned out the upper portion of the building. Loss on building is estimated at $10,000, which figure will be heavily increased by loss on machinery and stock, as yet undetermined. The company reports that delivery of orders will be resumed within a week. Arthur J. Rowland, superintendent, while inspecting the ruins, suffered a fall which resulted in breaking both his legs and one foot arch.

The W. F. Concannon Shear Co., 42 Depot Street, Milford, Conn., has recently been incorporated to manufacture steel shears and scissors. The capital stock is $20,000, and the officers are: President, W. F. Concannon, Bridgeport and Edwin L. Oviatt, Milford, treasurer. It has taken over the old mill building of the Milford Grain Co. and production has been started.

The New Haven Appliance Co., New Haven, Conn., was recently incorporated to carry on a general manufacturing business. The capital stock is $50,000 and the incorporators are H. H. Holmes, 126 Mansfield Street, H. W. McQuinn, New Haven, and R. H. Chirwin, Hamden, Conn.

A vocational department will be installed in the new junior high school to be erected by the city of Worcester. The Joseph D. Leland Co., Boston and Worcester, are architects-engineers.

The Narragansett Electric Lighting Co., 170 Westminster Street, Providence, R. I., has preliminary plans for a new power plant and mechanical works at Longfellow and Melrose streets. The power plant will be two-stories, 40 x 56 ft., and two mechanical buildings, three-stories, 100 x 222 ft., and one-story, 120 x 222 ft., respectively. The latter structure will be equipped with two electric traveling cranes. A machine shop and garage for company cars, 114 x 172 ft., will also be erected. The entire plant will approximate four acres of floor space. Bids will be asked early in March. Jenks & Ballou, 1035 Grosvenor Building, Providence, are engineers.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids until Feb. 15, under specification 4570, for a motor generator set and switchboard for use at the Connecticut submarine base of the department.

The Cumberland County Power & Light Co., Portland, Me., has awarded a contract to the Foundation Co., 120 Liberty Street, New York, for a new power plant, estimated to cost close to $1,000,000. Two turbine generating units will be installed, with auxiliary machinery.

A portion of the power house and other departments at the plant of the Atwood Box Co., Rock Village, Mass., were destroyed by fire, Feb. 1, with loss estimated at $30,000.

Indiana

INDIANAPOLIS, Feb. 7.

The Indiana Electric Corporation, Indianapolis, is planning for the construction of an electric generating plant on the Wabash River, in the vicinity of the Vigo County coal fields, estimated to cost close to $6,000,000, with equipment. Application has been made for permission to issue stocks and bonds to secure funds for the project. The company has also applied for permission to acquire seven electric power companies in this district, including the Merchants' Light & Heat Co., Indianapolis, for a consolidation.

Richard Miller, care of the City Trust Co., Market and Delaware streets, Indianapolis, is organizing a company to operate a commercial automobile service and repair plant. Plans are being prepared for a five-story and basement works, on Illinois Street, estimated to cost about $750,000. It will have a capacity of 700 cars. Bass, Knowlton & Co., 801 Hume-Mansur Building, are architects.

A vocational department will be installed in the two-story and basement high school, 200 x 248 ft., to be erected at Goshen, Ind., estimated to cost about $300,000. A. H. Elwood & Son, room 201, Haynes Building, Elkhart, Ind., are architects.

The Visible Pump Co., Ft. Wayne, Ind., with plant at New Haven, Ind., is planning for the immediate removal of its plant to a factory at Findlay, Ohio, where production will be increased.

The Bloomington Nash Motor Co., Bloomington, Ind., has awarded a contract to the State Construction Co., 727 Indiana Pythian Building, Indianapolis, for the erection of a two-story and basement service and repair works, 85 x 130 ft., to cost $80,000. Walter E. Hottle is head.

The Indiana & Michigan Electric Co., South Bend, Ind., has been granted permission by the Public Service Commission to issue preferred stock to an amount of $300,000, the proceeds to be used in part for extensions and improvements.

The South Bend Brewing Co., South Bend, Ind., is building a one-story ice-manufacturing plant, 90 x 90 ft., to cost about $60,000, including equipment.

The Bloomington Brick & Tile Co., Bloomington, Ind., has preliminary surveys under way for its new plant, estimated to cost about $200,000, including machinery. A. W. Beecher is president.

Baltimore

Baltimore, Feb. 6.

Fire, Jan. 30, destroyed one of the machine repair shops at the plant of the Bethlehem Steel Corporation, Sparrows Point, Baltimore, with loss estimated at about $50,000, including equipment.

The Board of Awards, City Hall, Baltimore, P. W. Wilkinson, secretary, is taking bids until Feb. 15, for six triple-combination, gasoline-driven pumping engines, and one 3½ to 4-ton tractor.

The Cumberland Sales & Service Station, Cumberland, Md., is having plans prepared for a new automobile service and repair building, 100 x 150 ft., estimated to cost about $100,000, including equipment. T. W. Biddle, Jr., Cumberland, is architect.

The $300,000 expenditure to be made by the Eastern Shore Gas & Electric Co., Salisbury, Md., during the present year for plant additions and improvements, will include the construction of a new generating plant at Laurel, Del., to cost about $160,000; installation of new equipment in the switching and transformer plant at Salisbury; new transmission lines to cost over $100,000, between Salisbury, Laurel and Denton, and to Cambridge, Md.; and miscellaneous distributing system equipment to cost about $30,000.

The Western Maryland Railroad Co., Baltimore, has leased its car and locomotive repair shops at Elkins, W. Va., to W. K. Hosier, contractor, who will operate the plant as a private enterprise. It has been giving employment to about 100 men, and this force will be retained.

The Bureau of Supplies and Accounts, Navy Department, Washington, is taking bids until Feb. 14, under schedule 9422, for two gasoline engines for the navy yard at Annapolis, Md.

The plant of the Hagerstown Bearing Metal Co., Hagerstown, Md., has been acquired by the Maryland Smelting & Refining Co., 28 West Antietam Street, Hagerstown, recently organized. John D. Keith and Henry H. Keedy, Jr., head the company.

The Board of Awards, City Hall, Baltimore, will take bids until Feb. 15, for furnishing and delivering steel screens for the Loch Raven Dam waterworks, as per specifications on file at the office of William A. Megraw, water engineer, City Hall.

The Northern Maryland Electric Co., Elkton, Md., has closed negotiations for the purchase of the Havre de Grace Electric Co., operating at Havre de Grace, Aberdeen and Perryville, Md., and vicinity. Extensions and improvements are planned. The Northern Maryland Company is said to be planning also for the purchase of the Gilpin Falls Electric Co., operating in the same section. J. H. Ware is president.

The Superior Anthracite Coal Corporation, Pulaski, Va., is planning for the installation of electrically operated mining machinery at its property, and other equipment. The company has increased its capital to $100,000. Clyde E. Smith is president.

Fire, Jan. 29, destroyed the planing mill and machinery of the plant of the Thomasville Variety Works, Thomasville, Ga., with loss estimated at about $75,000. K. E. Mack is head.

The Buick Ice Co., Cleveland, Ga., has plans under way for the erection of a new ice-manufacturing plant with initial capacity of about 30 tons a day.

The Wilson Motor Co., High Point, N. C., has acquired adjoining property and plans the erection of a three-story repair and service building, estimated to cost about $75,000.

The Jefferson Mfg. Co., Columbia, S. C., is planning for the establishment of a new plant to manufacture road machinery and parts, corrugated culverts, etc. Harry J. Kuhr, Columbia, is president.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids under schedule 4570, until Feb. 15, for a motor generator set and switchboard for the Hampton Roads, Va., navy yard.

The Consumers' Coal Co., Masonic Temple, Winston-Salem, N. C., will build a new ice-manufacturing plant, with daily capacity of 30 tons, which later will be more than doubled. It will cost close to $40,000.

M. L. Himmel & Son., 107 North Frederick Street, Baltimore, manufacturers of office fixtures, etc., are preparing to move into a larger plant at Calverton Road and Hollins Street.

Cincinnati

CINCINNATI, Feb. 6.

January was the best month in a year, from the machine tool manufacturers' standpoint, a number of fair sized orders being booked by local builders. The first week in February also showed fair activity and indications point to a steadily increasing business. During the week a local manufacturer booked an order for 10 shapers from an Eastern concern. A Michigan motor manufacturer is also understood to have placed an order for 12 grinding machines of special type in this market. A manufacturer of boring mills booked an order for three machines, and another manufacturer reports orders the past week for five drilling machines and three engine lathes. The International Nickel Co. purchased tools for its Huntington, W. Va. plant. A local planer manufacturer booked orders for two machines, one for Western shipment and another for a manufacturing plant in New York State. There are several inquiries before the trade, one of which is from the Ford Motor Co. for a large planer and another from a northern Ohio manufacturer for three gear cutting machines. The number of inquiries for single tools is also increasing steadily and a fair percentage is developing into orders. Local manufacturers see in the settlement of the Shantung problem, indications of better business with the Far East. One maker was informed by the president of a New York exporting house, which recently inquired for 15 tools for Japanese shipment, that this order and many others would probably be placed soon after the political problems in the Far East has been ironed out. Used machinery dealers report a slight falling off in the volume of business offering but there is still a fair market for what might be called bargains in used equipment.

The Hocking Valley Railroad Co. has issued a list of seven tools, including one 25 x 10 heavy geared head, a.c. motor driven engine lathe; one extra heavy double end car axle lathe with crane attachment 8 ft. between centers; one 18 x 8 heavy duty geared head a.c. motor driven engine lathe; one 24 x 8, heavy duty a.c. motor driven engine lathe; one 36 x 6, slab milling machine, motor driven; one 36 in. stroke motor driven, crank planer; one punch and shear capacity of 1-in. diameter holes ⅝-in. iron or mild steel.

The Universal Metal Box Co., Cincinnati, has been incorporated with a capitalization of $75,000. Its plans as to location and products have not been definitely completed. D. A. Walker, president Cadillac Can Co., 835 West Sixth Street, heads the company.

Fire Dec. 22 practically destroyed the plant of the Breese Brothers Co., sheet metal manufacturer, at 2347 Reading Road, Cincinnati. The damage is estimated at $50,000. Temporary quarters have been secured and business will be continued. Plans for the future have not been completed but it is expected that a larger building will be erected on the site of the old plant.

Reports are current that manufacturers of closely allied tools are considering the advisability of consolidating their interests to reduce manufacturing costs. This is more a subject for discussion among manufacturers who have large plants and in one instance something of this nature has already been done.

The Randle Machinery Co., 1772 Powers Street, Cincinnati, is in the market for one 75 to 100-kw., d.c., 220 volt, belted type generator with a speed of 600 to 1200 r.p.m. New or used equipment in good condition will be considered. It is also in the market for a number of small automatic gear cutters for cutting cotton mill spur gears from 1½-in. to 10-in. diameter. Gears to be cut are 5 pitch. Rapid and accurate work is essential.

The National Cash Register Co., Dayton, Ohio, is planning the erection of a five-story factory and also will make improvements on its school house and theater. Work will commence immediately.

The Mid-West Glass Co., 406 West Fourth Street, Cincinnati, has been incorporated with a capitalization of $300,000 to manufacture automobile accessories. It has taken over the Herschede Glass Co. and the Dacin Glass Co. and will at once commence the manufacture of glass fixtures and a gasoline gage. Albert W. Erkins is president.

The Gartland-Haswell Foundry Co., Sidney, Ohio, has been incorporated with a capitalization of $10,000. The foundry has been operated as a partnership and the change to incorporation is made merely as a matter of business convenience. J. C. Haswell, Dayton, Ohio, is president.

The Ohmer-Fare Register Co., Dayton, Ohio, which recently went into production on the Ohmer Truck Auditor, is not contemplating immediate extensions to its plant, according to officials of the company. It is possible, however, that in the near future it will be necessary to enlarge its capacity.

The Central South

ST. LOUIS, Feb. 6.

The Board of Public Improvements, City Hall, Hannibal, Mo., has plans under way for a municipal electric light and power plant, estimated to cost about $170,000. The Arnold Co., 105 South La Salle Street, Chicago, is engineer.

The Derby Oil Co., Wichita, Kan., has work under way on a new oil refinery to cost about $500,000, including machinery.

The Lee Mfg. Co., Vandalia, Mo., manufacturer of automobile tire chains, has acquired property at Jefferson City, Mo., and contemplates the removal of its plant to this location. The present works will be enlarged at the new location. Ralph Knox is president.

The City Council, Parsons, Kan., will soon call for bids for a new steam-operated power plant, to be used in connection with the waterworks system. Burns & McDonnell, 402 Inter-State Building, Kansas City, Mo., are consulting engineers. F. W. Frye is city clerk.

The Arctic Dairy Products Co., 415 West Sixteenth Street, Kansas City, Mo., is arranging for the erection of a new ice-manufacturing plant, with initial capacity of about 2500 tons, estimated to cost about $45,000.

The Crane Enameling Co., Chattanooga, Tenn., recently formed as a subsidiary of the Crane Co., 835 South Michigan Avenue, Chicago, with capital of $1,500,000, has acquired the Cahill Iron Works and the Mutual Enameling Co. both of Chattanooga, and will merge the interests with its organization. The purchasing company will operate both plants, comprising the new factory of the Mutual company in the Alton Park section, which will be used as the principal manufacturing unit, and the Cahill plant on Chestnut Street. Employment is now given to about 400 men. R. T. Crane, Jr., head of the parent company, is president of the consolidated organization.

A vocational department will be installed in the new two-story and basement high school, 97 x 130 ft., to be erected at Preston, Kan., estimated to cost about $85,000. The contract has been let to George E. Dalton, Junction City, Kan. H. A. Noble, 411 Reliance Building, Kansas City, Mo., is engineer.

The Common Council, Altus, Okla., is arranging for the establishment of a municipal electric power plant to cost about $115,000.

The Standard Crate & Filler Co., Jefferson City, Mo., recently organized with a capital of $1,500,000, has acquired the plant of the J. M. Hays Wood Products Co., and will operate it as the first unit of its works. About 50 acres has been secured and plans are being prepared for the erection of an adjoining works to manufacture strawboard and kindred products, estimated to cost about $400,000, including machinery. A. W. Happy is general manager.

The Southern Refrigeration Co., Unika Bank Building, Johnson City, Tenn., has preliminary plans under way for a new three-story ice-manufacturing and cold storage plant, 100 x 100 ft., estimated to cost $200,000, including machinery.

The Common Council, Hutchinson, Kan., is having plans prepared for the erection of a one-story automobile service

and repair building for municipal cars, estimated to cost about $50,000. R. B. Lee, City Hall, is engineer in charge.

A vocational department will be installed in the new high school to be erected at Wichita, Kan., for which $1,000,000 in bonds have been voted. Lorentz Schmidt & Co., 121 North Market Street, architects, will prepare plans. J. L. Leland is city clerk.

The American Commercial Car Co., Gratiot and French streets, Detroit, will build two additions to the building recently acquired at Knoxville, Tenn., for a branch plant, to be 62 x 125 ft. and 62 x 100 ft. respectively, estimated to cost about $30,000. Bids will be taken at once. R. F. Graf & Sons, Knoxville, are architects and engineers.

The Board of Education, Library Building, Kansas City, Mo., has taken bids for a new four-story and basement manual training school, 110 x 117 ft., in connection with the present high school building. C. A. Smith, 602 Finance Building, is architect. J. B. Jackson is secretary of the board.

Following the approval of a bond issue for $300,000 at a recent special election, the City Council, Lawton, Okla., will soon select an engineer to prepare plans for the proposed municipal electric power plant and extensions in the distributing system. J. M. Haynes is secretary of the council.

The American Paper Products Co., St. Louis, is in the market for a second-hand 1000-1250 or 1500-kw. turbine with condenser, in good condition. Ley P. Rexford is president and general manager.

Milwaukee

Milwaukee, Feb. 6.

The machine tool trade is undergoing an appreciable revival of buying interest and while the volume is by no means large or satisfactory, nevertheless inquiry of the past 10 days has been much more encouraging than at any time since the middle of December. The automotive industries seem to be manifesting greatest interest, due doubtless to the favorable impression made upon consumers by price reductions and the effect of the midwinter expositions, which is reflected by greater activity in local automotive parts industries, this being one of the principal centers of this character in the United States. Sales of milling machines are still few and far between, the bulk of business now passing being in lathes, boring mills, drill presses and grinders. Foundries here are steadily making small increases in working forces to handle new orders, which, however, are spotty and irregular rather than on an extended contract basis, leaving vacancies off and on in operating schedules.

The Green Bay, Wis., Warehouse & Cold Storage Co. has let a contract to the L. M. Hansen Co., local contractor, for the general construction of a new cold storage warehouse and refrigerator plant estimated to cost $300,000, at Broadway and the Chicago & Northwestern Railroad tracks. The order for refrigerating machinery and equipment will be placed within a short time. The warehouse will be occupied by Armour & Co., Chicago, and five other concerns.

The Perfect Pump & Mfg. Co., Marshfield, Wis., has been granted a charter to manufacture and repair pumps, machinery, appliances, etc. It is incorporated with $25,000 capital stock by Vernon Berg, F. L. Grube and Hugh W. Goggins. An experimental shop has been conducted for some time and will be enlarged into a manufacturing plant.

The Eagle Mfg. Co., Appleton, Wis., manufacturer of tractors and feed cutters, at its annual meeting voted to engage in several other lines of power farm operating equipment which it is now developing. For the present only a small quantity of new tools will be required, but later larger needs are expected to appear. A. W. Priest is president, and Charles Hagen, general manager.

The Fessenden-Ellis Co., Sheboygan, Wis., has been organized with $5,000 capital stock by Louis P. Fessenden, Harry E. Ellis and J. B. Fessenden to manufacture pressure governors and similar appliances for controlling steam, gas and air. Steps will be taken at once to provide manufacturing and assembling quarters in Sheboygan.

The Richter Mfg. Co., Highland, Wis., manufacturer of adjustable farm gates and similar agricultural specialties, will incorporate its business with $25,000 capital, following the entrance of William Gabler and Frank Wepking as part owners. The present factory will be doubled in size early in the spring.

The Advance Auto Body Co., Milwaukee, has been incorporated with a capital stock of $110,000 to manufacture and repair automobile bodies. The incorporators are John A. Dietrich, Julian Olds and Howard T. Foulkes, attorneys, 91 Mason Street, representing interests whose identity will not be revealed until the enterprise reaches maturity.

The Safety Traffic Light Co., Milwaukee, has been organized by Richard F. Downey, 391 Pryor Avenue, and Walter W. Lange, president South Side Malleable Casting Co., Fourteenth and Windlake avenues, to manufacture a patented dome light of counter-balanced design. Temporary offices have been opened at 425 East Water Street.

The Purcell-Wischan Co., Madison, Wis., automobile dealer, has let the general contract to Klug & Smith, consulting engineers, Mack Block, Milwaukee, for the erection of a public garage, sales and service building, 100 x 121 ft., two stories and basement, estimated to cost $75,000. The machine shop will occupy a space, 60 x 100 ft., and will require a miscellaneous equipment of shop tools, fixtures, etc.

The Merrill Buick Co., Merrill, Wis., has plans for a new sales and service building, 57 x 125 ft., part two stories and basement, to be ready June 1. It will cost about $25,000 complete.

The S. W. Miller Piano Co., Sheboygan, Wis., which disposed of its factory several months ago to the Sheboygan Fibre Furniture Co., to facilitate the expansion of the latter concern, has purchased a new site at Washington Court and Niagara Avenue, 108 x 600 ft., and will start work at once on the erection of a one-story brick and concrete factory, 56 x 108 ft., as a first unit of a new plant. In the meantime it is continuing production in a part of the original plant, which must be vacated May 15.

The Lincoln Warehouse & Auction Co., 226 Fourth Street, Milwaukee, has plans by G. H. Leipold, architect, 169 Martin Street, for a six-story, reinforced concrete, brick and steel building, 120 x 160 ft., at Third and Prairie streets, to cost $250,000. It will require fire doors, steel sash, elevators, conveyor systems, boilers, etc.

The American Metal Products Co., Milwaukee, which recently completed its new brass and bronze foundry with electric furnace equipment at Thirty-third Avenue and Burnham Street, is engaging in quantity production of a poppet valve for internal combustion engines made from Ampco bronze, a patented process. It will continue to make bronze castings by this formula, as well as bearing metals, ingots, etc. Carl J. Zaiser is general manager.

Arthur Seidenschwarts, architect, 425 East Water Street, Milwaukee, is taking bids in behalf of an unidentified interest for the construction of a public garage and repair shop, 100 x 150 ft., part two stories and basement, at Fifth and Cherry streets. It will cost about $50,000.

The Three Lake, Wis., Board of Education has let the general contract to Hugo V. Hertling, Inc., Manitowoc, Wis., for a new high school with manual training department, estimated to cost $125,000. Oppenhamer & Obel, Wausau, Wis., are the architects.

The Invincible Metal Furniture Co., Manitowoc, Wis., contemplates the erection of an addition to its factory which will increase its capacity from 50 to 75 per cent by June 1. The present plant is overcrowded with orders and more room is needed at once. At the annual meeting, John Schuette was elected president to succeed Louis Schuette. I. M. Stauffacher, Monroe, Wis., was re-elected secretary; George Alter, treasurer, and P. M. Wege, vice-president.

The Board of Education, DePere, Wis., is taking sealed bids until Feb. 25, for a new $200,000 high school, which will contain vocational training facilities. The architects are Foeller, Schober & Stephenson, Green Bay, Wis.

The Allan-Diffenbaugh Wrench Co., Baraboo, Wis., manufacturer of patented wrenches and tools for machine and automotive shops, has booked several large jobbing orders which will keep the plant busy for more than 60 days. The line is being enlarged to embrace pipe wrenches up to 4-in. capacity. The shop equipment is being increased gradually to meet new demands.

Walter S. Woods, consulting engineer, LaCrosse, Wis., is taking bids in behalf of Dr. E. C. Swartout, 904 Rose Street, LaCrosse, for the construction of a 16-ft. concrete dam, 166 ft. long, remodeling the power house, and installing new dynamos, switchboards, waterwheels, etc., at West Salem, near LaCrosse. The work will cost about $65,000 complete.

The Little Wolf Lumber Co., Manawa, Wis., will build a new hydro-electric power plant, with auxiliary steam equipment at an estimated cost of $25,000. The work is in charge of Thomas W. Orbison, consulting engineer, 812 College Avenue, Appleton, Wis.

The Beaver Dam, Wis., Board of Education will take bids about March 1 for a two-story fireproof high school building, L-shaped, 7 x 139 and 30 x 130 ft., designed by Parkinson & Dockendorff, architects, LaCrosse, Wis. It will cost about $200,000. George R. Ray is superintendent of schools.

The Simplicity Engine & Mfg. Co., Port Washington, Wis., has put into production a portable reboring and

regrinding tool combining two approved methods of fitting gas engine blocks with new pistons. It is designed principally for garage and repair shop use.

The Standard Mfg. Co., Appleton, Wis., manufacturer of wood products, has increased its capital stock from $80,000 to $160,000. It is building a new sawmill costing about $75,000 with machinery and equipment. R. O. Schmidt is president and general manager.

Pittsburgh

PITTSBURGH, Feb. 6.

As far as inquiries are concerned, there is a fairly active market in machine tools in this district, but sales so far this month are not showing up much better than January, which, with most of the trade, was a disappointment. One dealer reports the sale of a 24-in. Steptoe shaper for shipment to Butler, Pa., and a 31-in. motor-driven Rockford drilling machine to go to Shreveport, La. The U. S. Electrical Tool Co. has sold a 5-hp. heavy floor grinder to the Oil Well Supply Co. for shipment to Tulsa, Okla., and three grinders to the Westinghouse Electric & Mfg. Co. for installation at its Springfield, Mass., works. All bids against the 22 tools inquired for several months ago for the Western Penitentiary have been rejected, and it is now proposed to buy the tools as they are wanted. The Wheeling Steel Corporation has a list out for about 20 tools for its new rod and wire mills being constructed at its Portsmouth, Ohio, works and is expected to issue the list soon against the tools which will be wanted in connection with the improvements now in progress at Steubenville, Ohio. The crane market is almost stagnant. There are occasional requests for prices for estimating purposes, but new inquiries are lacking. It does not seem to be a question of price on either machine tools or cranes that is blocking sales. In both classes of equipment prices named are down to actual costs, and in some instances even lower, but prospective buyers do not seem to be willing to spend money at the present time and seem to believe they will be able to save on freight charges later. The borough of Tarentum, Pa., has placed the order for a 2,000,000-gal. pumping engine with the Worthington Pump & Machinery Corporation.

H. R. Eicher, House Building, Pittsburgh, is inquiring for a crane, steam or electric, 7 to 10 tons capacity, 35 ft. boom, with clamshell bucket, ¾ to 1-yd. capacity, straight traction or caterpillar trucks, with boiler and appurtenances.

The Standard Motorcar Co., Pittsburgh, has been organized by interests connected with the Standard Steel Car Co., Frick Building, to take over the manufacture and sale of the automobile branch of the latter organization. Operations will be conducted as heretofore and general expansion is planned. Don C. McCord has been elected vice-president of the new company, in charge of finance and sales, resigning a similar position with the Bankers' Commercial Securities Co., 19 West Forty-fourth Street, New York.

The Greenwood Construction Co., Terminal Building, Pittsburgh, has awarded contract to Walker & Curley, Farmers' Bank Building, for a new one-story mechanical shop, 82 x 120 ft. and 86 x 165 ft., at Carson and Twenty-fourth streets, estimated to cost in excess of $60,000.

The West Penn Power Co., Pittsburgh, will increase the capacity of its Windsor power plant, Beech Bottom, W. Va., with the installation of two new 30,000-kw. turbo-generators and auxiliary operating equipment, estimated to cost in excess of $3,000,000, including line construction. The company is also planning for extensions in its Springdale power plant with new equipment to effect a combined generating capacity at all plants of close to 190,000 kw.

The Corry-Jamestown Mfg. Co., Corry, Pa., manufacturer of metal furniture, is considering plans for an addition to its plant. D. A. Hillstrom is local manager.

The Lundale Coal Co., Lundale, W. Va., is planning for the construction of a new tipple in the vicinity of Three Forks, W. Va., including the installation of electrically operated and other mining machinery. The proposed work is reported to cost in excess of $500,000. George M. Jones, general manager, is in charge.

A vocational department will be installed in the two-story and basement high school to be erected at Wayne, W. Va., estimated to cost about $180,000. Holmbee & Pogue, Empire Bank Building, Clarksburg, W. Va., architects, are preparing preliminary plans. Herman P. Dean is secretary of the board.

The Williamson Supply Co., Williamson, W. Va., manufacturer of mine equipment and supplies, is planning to rebuild the portion of its plant recently destroyed by fire with loss estimated at about $100,000.

The Hancock Steel Co., Martinsburg, W. Va., is completing financing work in connection with its new plant at Hancock, Md., plans for which have been held in abeyance for some months. It is expected to call for bids at an early date for the erection of the first unit, comprising a one-story foundry, to be followed by a machine shop. Ernest McGeorge, 1900 Euclid Building, Cleveland, is engineer. F. Vernon Aler, Martinsburg, heads the company.

The Grasselli Chemical Co., Guardian Building, Cleveland, is planning for the construction of a new pumping plant in the Lost Creek, W. Va., section to cost about $50,000, with machinery, for service at its plants at Grasselli and Meadowbrook, W. Va.

A vocational department will be installed in the junior high school, 72 x 219 ft., to be erected at West Charleston, bids for which are being taken up to Feb. 21. It is estimated to cost about $150,000. Tucker & Patterson, Masonic Temple, are architects.

The Guyan Machine Shops, Logan, W. Va., are making inquiries for tools and operating equipment, including a turret lathe for brass bushing work; lathe for turning steel locomotive wheels; punch and shear to handle ½-in. plate; chain hoists, ½ to 2-ton capacity; a quantity of shafting, steel and nickel, from 2 to 4¼ in. in diameter and metal lockers and tool racks for machine shops.

The Gulf States

BIRMINGHAM, Feb. 6.

The W. L. Lemly Foundry Co., Bessemer, Ala., manufacturer of iron pipe, etc., has acquired the Columbus Foundry Co., Columbus, Ga., manufacturer of similar products, and will merge the business with its organization. The pipe works at Columbus will be removed to the Bessemer plant.

The Common Council, Hitchcock, Tex., is planning for the installation of a municipal electric light and power plant to cost about $50,000. A municipal ice-manufacturing plant is also planned.

A vocational department will be installed in the new high school to be erected at Stamford, Tex., estimated to cost about $80,000. N. S. Holland is superintendent of schools.

Fire, Jan. 27, destroyed a portion of the oil refinery of the Terrell Cotton Oil & Refining Co., Terrell, Tex., with loss estimated at about $50,000, including equipment. It is planned to rebuild. Grover G. Fix is general manager.

The Galveston-Houston Electric Co., Houston, Tex., has arranged for a bond issue of $1,700,000, a portion of the proceeds to be used for plant extensions and improvements.

The Edwards Mfg. Co., 529-49 Eggleston Avenue, Cincinnati, manufacturer of sheet metal products, has completed plans and will soon break ground for its proposed new branch factory at Dallas, Tex., to be three stories, 100 x 200 ft., and estimated to cost about $60,000. James F. Agnew is manager in charge.

The Texas Utilities Light & Power Co., Lubbock, Tex., is having plans prepared for rebuilding its local electric light and power plant, recently destroyed by fire.

The Humphreys-Pure Oil Corporation, Mexia, Tex., will commence erection early in the spring of its new oil refinery at Port Neches, Tex., to have an initial output of about 40,000 bbl. per day. Col. E. A. Humphreys is head.

The Massey Concrete Products Co., Dallas, Tex., is arranging for the erection of an addition to cost about $200,000, including machinery. Plans will be prepared at an early date.

The Florinda Mill & Planing Co., Sumica, Fla., has completed plans for a new factory to cost about $100,000, with machinery, to replace its works recently destroyed by fire. The installation will comprise planers, saws, matchers, etc., to provide for a daily output of about 35,000 ft. of timber. W. J. Fink is manager. G. F. Hauserman is construction engineer.

The Orleans Steel Products Co., 1021 Bienville Street, New Orleans, is making inquiries for power crankshaft grinding machines and attachments, and other equipment for automotive work.

The City Council, Orlando, Fla., is completing negotiations with the Orlando Water & Light Co. for the purchase of its local plant, to be operated in the future as municipal property. Extensions and improvements will be made and new equipment installed.

The Pacific Coast

SAN FRANCISCO, Jan. 31.

The Day & Night Solar Heater Co., Monrovia, Cal., will commence the immediate erection of a new one-story plant at Shamrock Street and Foothill Boulevard, for the manufacture of heaters and heating equipment, estimated to cost about $30,000.

Grace Brothers, Santa Rosa, Cal., are having plans prepared for a three-story, reinforced-concrete addition to their ice-manufacturing and refrigerating plant, 60 x 76 ft.

Fire, Jan. 21, destroyed a portion of the plant of the Los Angeles Enameling & Japanning Co., 118 East Ninth Street, Los Angeles, with loss estimated at close to $20,000. The works will be rebuilt.

The American Refrigerating Co., Redondo, Cal., has preliminary plans under way for a new ice-manufacturing and refrigerating plant at Anita Street and the Camino Real, estimated to cost in excess of $50,000.

Fire, Jan. 26, destroyed the power house of the Southern California Edison Co., Los Angeles, at Los Alamitos, Cal., with loss estimated at about $75,000. It will be rebuilt.

The City Refrigerator & Fixture Co., Los Angeles, manufacturer of refrigerators, metal fixtures, etc., has had plans prepared for a new one-story plant, 40 x 135 ft. O. M. Warner, 220 Stimson Building, is architect.

The California Motor Car Co., Richmond, Cal., manufacturer of automobiles and occupying a temporary plant, has preliminary plans under way for the first unit of its new works on about six acres, recently acquired at Martinez. A main machine shop will be constructed, estimated to cost about $45,000, and of which amount approximately one-half will be expended for machinery.

A vocational shop building will be erected at the new group of high school buildings to be erected by the Board of Education, Whittier, Cal., estimated to cost about $525,000. Preliminary plans are being prepared by Myron Hunt, 1107 Hibernian Building, Los Angeles, architect.

The Santa Fe Railway Co., Kerckhoff Building, Los Angeles, will commence the immediate erection of a new ice-manufacturing and railroad refrigerator car precooling plant at Riverbank, Fresno County, comprising a main building, 146 x 170 ft., with extensions, 86 x 134 ft., and a number of smaller structures. A cooling tower, 45 x 98 ft., will be constructed.

The City Council, Eugene, Ore., has tentative plans for a municipal hydroelectric generating plant on the McKenzie River.

M. F. Buchman, Seattle, care of Thompson & Thompson, Mutual Life Building, architects, is having plans prepared for a new one-story machine shop at Seventh Avenue and Broad Street, estimated to cost about $15,000, exclusive of equipment.

James Lindsey, 438 Worcester Building, Portland, Ore., and associates are planning the erection of a hydroelectric generating plant in the Marion Lake district, near Salem, Ore., estimated to cost about $225,000.

Canada

TORONTO, Feb. 6.

A better buying movement is steadily making its appearance in this market, some dealers having booked fair sized orders during the week. Within the past few days dealers have closed orders for a number of tools for the Durant Motors, Ltd., which is equipping its plant at Leaside, Toronto, and it is expected that further buying will be done by this concern in the early future. Big lists continue absent from the market, but there is a fairly active demand for one or two machines from buyers spread over a wide territory. Equipment makers state business is becoming stronger and several have recently added to their working staffs. The demand for small tools is also making headway and dealers handling these lines report good business.

The Ontario Creameries, London, Ont., are in the market for complete refrigeration and ice-making equipment, estimated to cost $30,000.

Merlin, Ont., plans to spend $28,000 on a power and light distributing plant.

Walkerton, Ont., will erect a power distributing station and install equipment to cost $40,000.

The City Council, Collingwood, Ont., is asking for prices on motor generator and storage battery, to replace a wet battery system.

Wiarton, Ont., plans improvement to its water pumping plant including the installation of an electrically operated pump and large gasoline engine. Prices are asked on equipment estimated to cost $25,000.

Baker & Redden, Thomas Street, Windsor, N. S., will build a sash and door factory and are receiving prices and information regarding equipment.

The factory owned by the Leggatt & Platt Bed Spring Co., 928 McDougall Street, Windsor, Ont., was recently damaged by fire with a loss of $12,000.

The United States Hoffman Machinery Corporation, manufacturer of sanitary steam clothes pressing machinery, with its main office in New York, has a plant at Syracuse, N. Y., and has been in existence for the past 12 years, first under the name of T. D. Palmer Co., and later under the name of United States Hoffman Co., and United States Hoffman Machinery Co.

OFFICE CHANGES

W. E. Hopton, the Hopton Co., White Memorial Bldg., Syracuse, N. Y., with branch office at Rochester, N. Y., has been named selling agent in New York State with exception of New York City and territory south of Albany, for the Atlas Car & Mfg. Co., Cleveland, manufacturer of storage battery locomotives and trucks, electric locomotives and cars, complete equipment for industrial railroads including dryer cars, transfer cars, turntables, specially designed cars for rolling mills, mines, factories and plantations and by-product coke plant equipment.

The Chillingworth Engineering Corporation, 143 Liberty Street, New York, announces that it has associated with it Frank H. Plum, Herbert Pluemer, George E. Mellin and Harold Von Thaden, formerly of the C. W. Hunt Engineering Corporation, and with the consent and approval of the Hunt corporation will carry on a business of a character similar to that conducted by the latter.

The general offices of Pneumercator Co., Inc., have been removed from 15 Park Row, New York, to Sperry Building, 40 Flatbush Avenue Extension, Brooklyn.

On April 1 the Barrett-Cravens Co. will move to its new four-story factory recently acquired at Monroe and Throop streets, Chicago.

The Homestead Sales Corporation, 242 Lafayette Street, New York, has been appointed sole agent for New York and vicinity by the General Specialty Co., Buffalo, N. Y., in the sale of its torpedo tube cleaner and other boiler cleaning specialties. E. E. Jones, manager Homestead Sales Corporation, reports a reviving interest in the valve and steam specialty line. This company is now handling the following lines: Homestead valves, General Specialty Co.'s line of tube cleaners, Atlas valves and steam specialties.

The Rathbun Jones Engineering Co., Toledo, Ohio, has appointed the Ingersoll-Rand Co., New York, general sales agent for Rathbun gas engines. These engines are well known to the trade. They are of the vertical, multi-cylinder type and are built to operate on natural, illuminating, producer, coke oven, oil still and other forms of gases which can be successfully handled in an internal combustion engine. Sizes range from 100 brake hp. to 1450 brake hp.

Coleman-Shoemaker, Inc., Philadelphia, now occupies its new plant at Twentieth and Clearfield streets, where it has a railroad siding and overhead crane. This makes it possible to render greater service in handling machinery.

The Blairsville Iron Works has been sold to a new corporation, which will be known as the Conemaugh Iron Works Co., with general offices at Latrobe, Pa., and works at Blairsville, Pa. The company makes split ingot molds, stools and gray iron castings.

Iron Trade Products Co., Farmers Bank Building, Pittsburgh, has taken over for a period of years the exclusive sales agency for the Seanor Coal Mining Co., operating 800 acres of low volatile coal; mine known as Heckler Mine, Seanor Station, Somerset County, Pa., Pennsylvania Railroad, Group 1. This is a Pool 9 low volatile coal.

The name of the Globe Steel Co., Mansfield, Ohio, has been changed to the Globe Iron-Crush & Shot Co.

E. F. Whitaker has become associated with Frank W. Trabold, 30 Church Street, New York, to serve as direct agent of Armstrong Bros. Tool Co., Spicer Mfg. Co., the Bronzo Alumina Co. and the Cleveland Abrasive Wheel Co., Cleveland. A new safety hoist hook will be distributed.

Pittsburgh office of Briggs & Turivas, Inc., Chicago, iron and steel scrap, has been removed from 911 Union Arcade to 427 Oliver Building. T. S. Downing is manager.

Youngstown Boiler & Tank Co. Meeting

Last year the Youngstown Boiler & Tank Co., Youngstown, Ohio, operated an average of 80 per cent., shareholders were informed Jan. 26 at the annual meeting. At present operations are not in excess of 65 per cent. The company has a force of about 50 erectors in the field. It manufactures tanks and fabricates steel work.

The company now has in course of erection four 50,000-bbl. oil storage tanks in the South-West for an oil refining interest.

These directors were elected—James P. Keene, William H. Heywood and Charles R. Vogel of Youngstown; R. I. Ingalls of Birmingham, Ala. and R. D. Patterson of Dayton, Ohio. Directors elected the following officers—President, James P. Keene; vice-president, R. I. Ingalls and secretary-treasurer, Charles R. Vogel.

IRON AND STEEL STOCKS

Prices for Grains May Have Been a Sustaining Factor

Most of the steel shares have been in better demand of late and prices for them have ruled firm. Reasons for the better demand are not clear. Quarterly earnings statements, issued recently, while indicating a turn for the better has come in the steel industry, disclose little more. Incoming business is not of sufficient volume to materially increase mill production. Nothing has been said recently regarding mergers of steel properties but what already is known. Higher prices quoted for wheat, corn and oats represent greater buying power of farmers and increased railroad earnings. Possibly there is some connection between grain and steel share quotations.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chal., com..	41¼ - 46¼	Lackawanna St..	45½ - 47⅛
Allis-Chal., pf. ..	90½ - 92	Midvale Steel ...	28¾ - 30⅝
Am. Can, com...	36½ - 38¼	Nat. Acme	11½ - 12½
Am. Can, pf.....	95 - 96	Nat. E. & S., com.	35½ - 41½
Am. C. & F., com.	144½-146⅜	N. Y. Air Brake.	57 - 58¼
Am. Loco., com..	104½-108⅝	Nova Scotia St..	25¾ - 27½
Am. Loco., pf...	113½-114	Pitts. Steel, pf..	.. - ..
Am. Rad., com..	82 - 83	Pressed St., com.	63½ - 65⅝
Am. St. Fd., com.	30⅞ - 32⅝	Pressed Steel, pf.	.. - 93
Am. St. Fd., pf..	.. - 94	Ry. St. Sp., com.	95½ - 98
Bald. Loco., com.	94½-102¼	Ry. St. Sp., pf...	.. -112
Bald. Loco., pf..	106 -106½	Replogle Steel ..	28¼ - 31⅝
Beth. Steel, com.	55 - 57⅞	Sloss, com.	41 - 41¾
Beth St., Class B	59⅛ - 62	Superior Steel...	28¼ - 30
Beth. St., 8% pf.	106⅞-108	Transue-Williams	32¾ - 34
Chi. Pneu. Tool..	59 - 64¾	Un. Alloy Steel..	26½ - 28
Colo. Fuel	25¼ - 26¼	U. S. Pipe, com..	17 - 19¾
Crucible St., com.	59½ - 62¾	U. S. Pipe, pf....	56 - 58½
Crucible St., pf..	80 - 82	U. S. Steel, com..	84⅝ - 87¼
Gen. Electric ...142	-148	U. S. Steel, pf...	115⅝-117½
Gt. No. Ore Cert.	31⅝ - 34	Vanadium Steel..	32¾ - 35⅝
Gulf States Steel	66 - 74¾	Va. I. C. & Coke	80 - 84
Int. Har., com...	81⅝ - 83¾	Westinghouse El.	50¾ - 53½

Midvale Steel & Ordnance Co. Deficit

The Midvale Steel & Ordnance Co. reports for the quarter ended Dec. 31, last, net income after taxes of $828,358, compared with $688,238 in the preceding three months, and with $4,778,127 in the final quarter of 1920. After depreciation there was a deficit of $1,379,782, contrasted with a deficit of $1,249,136 in the September quarter, and with a balance for dividends of $2,056,724, equal to $1.03 per share on the stock in the last quarter of 1920. The statement follows:

	Fourth Quarter, 1921	Third Quarter, 1921	Fourth Quarter, 1920
Net after taxes.....	$828,358	$688,238	$4,778,127
Bond interest	744,848	745,048	762,128
Balance	$83,510	*$56,810	$4,015,999
Depreciation res.....	1,463,292	1,192,326	1,959,275
Deficit	$1,379,782	$1,249,136	†$2,056,724

*Deficit. †Balance.

Based on the quarterly reports the company for the year ended Dec. 31 last, shows net after taxes of $2,624,697, compared with $21,924,650 in 1920 and with $19,345,840 in 1919. After depreciation reserve there was a deficit of $5,313,513, contrasted with a balance of $12,371,298, equal to $6.18 per share in 1920, and with $10,387,418, equal to $5.19 per share in 1919. Comparisons follow:

	1921	1920	1919
Net after taxes.....	$2,624,697	$21,924,650	$19,345,840
Bond interest	3,005,622	3,073,531	3,141,509
Deficit	$380,925	†$18,851,119	†$16,204,331
Depreciation res.....	4,932,588	6,479,821	5,816,913
Deficit	$5,313,513	†$12,371,298	†$10,387,418

†Balance.

Report of Newton Steel Co.

Gross sales of the Newton Steel Co., Youngstown, Ohio, in 1921, were $2,872,866, according to the annual report submitted Feb. 1 to stockholders. Present unfilled orders are sufficient to enable normal production for 60 days, coming principally from the automobile industry. The company showed a gross profit last year of $365,837 and a net profit of $29,047 after all reserve charges, taxes and miscellaneous claims. After paying the annual 7 per cent dividend on $705,000 of outstanding preferred stock the company reported a deficit of $18,444. Average operations last year were at 60 per cent. For two months the company's plant was wholly suspended.

Directors, who were re-elected, are Edward F. Clark, H. M. Steele, J. H. Fitch, Jr., W. H. B. Ward, H. A. Taylor, John W. Ford and George T. Fillius. Officers are Edward F. Clark, president and general manager; H. M. Steele, vice-president in charge of operations; J. H. Fitch, Jr., vice-president in charge of sales, and R. A. Kenworthy, secretary and treasurer.

The company's plant, located on a 150-acre tract at Newton Falls, Trumbull county, consists of eight stands of roughing mills and eight stands of finishing mills. It is entirely electrically driven and so built that extensions may be efficiently made when required. The company manufactures special high grade sheets for the automobile, metal furniture and Pullman trades. It has capacity for 50,000 tons of finished product annually.

Lake Erie Bolt & Nut Co. Plans

In order to provide additional working capital stockholders of the Lake Erie Bolt & Nut Co., Cleveland, are being advised of a refinancing plan to permit the company to take advantage of a new lease on the present plant and to supply it with funds for operating purposes. It is proposed to change the present company from a Delaware to an Ohio corporation and to make the authorized capital stock 70,000 shares of new par stock, 60,000 of which will be issued at this time. Present stockholders will receive four shares of the new stock for one share of the present preferred stock and the payment of $42. With no cash payment the exchange will be made share for share. Holders of common stock will receive one share of new stock for each 100 shares of present common stock. A meeting of the stockholders will be held Feb. 9 to vote on the refinancing plans.

Industrial Finance

Between 98 and 99 per cent of the stockholders of the American Brass Co. have turned in their stock for the merger with the Anaconda Copper Co.

The directors of the Saco Lowell Shops, Boston, textile machinery, have recommended an increase of $1,762,500 in the common share capitalization for the purpose of paying a stock dividend of 50 per cent to owners of common shares. Stockholders will act on the recommendation Feb. 15.

Edmund Wolfe, president First Bridgeport National Bank, and Elmer Havens, president Locomobile Co., Bridgeport, Conn., automobiles, have been made temporary receivers for the Locomobile Co.

The Kerite Insulated Wire & Cable Co., Seymour, Conn., has issued $150,000 additional stock, bringing the capitalization up to $350,000. The new capital will be used to raise money for working capital and to reduce current indebtedness.

The directors of the American Rolling Mill Co., Middletown, Ohio, at their January meeting took no action on the stock dividend that it has been customary to declare. Members of the board expressed the opinion that it would be inadvisable to increase the stock of the company by such a dividend at this time in view of the general unsettlement in industrial and financial conditions.

The Folsom-Miller Co., Markesan, Wis., manufacturer of washing machines, has filed a voluntary petition in bankruptcy. Schedules claim assets of $32,533 and admit liabilities of $132,966.67, of which $60,345 is due Guy Miller, treasurer, and $59,153 to S. P. Folsom, president, for payment of corporation debts and money advances.

Articles of dissolution have been filed by the Oshkosh Tractor Co., Oshkosh, Wis., a Wisconsin corporation with $1,200,000 capital stock, organized a year ago to take over the business of the LaCrosse, Wis., Tractor Co.

The Brazil Trust Co., Brazil, Ind., has been appointed receiver for the Union Steel Mfg. Co., which moved its plant to Brazil from Chicago about a year ago and manufactures tools and automobile parts.

The Truscon Steel Co., Youngstown, Ohio, is now paying 17½c. per share quarterly on its common stock, or at the annual rate of 7 per cent, as compared with 40c., or a yearly dividend rate of 16 per cent.

Business of the William P. Pollock Co., fabricating interest of Youngstown, Ohio, was in excess of 50 per cent of capacity last year, according to statement at the annual meeting. At present the company's capacity is idle. Directors re-elected are: Porter Pollock, W. G. Wilson, John Kirby, J. H. Warne, Alexander Best, Harry Payne and Edgar J. Reilly. Directors elected these officers: President and treasurer, W. G. Wilson; vice-president and general manager, J. H. Warne; vice-president and general superintendent, John Kirby and secretary, Alexander Best.

The Struthers Furnace Co., Cleveland, Ohio, operating a merchant blast furnace at Struthers, Mahoning County, Ohio, paid its quarterly preferred dividend Feb. 1 of $1.75 per share. The company was founded in 1869 and has been under the same management for upwards of 35 years. It has no bonded debt and has never defaulted on its preferred dividend.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined bars, base price	2.53c.
Swedish bars, base price	10.00c.
Soft steel bars, base price	2.53c.
Hoops, base price	3.38c.
Bands, base price	3.13c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.63c.
Channels, angles and tees under 3 in. x ¼ in., base	2.53c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.50c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.70c.
Toe-calk, ½ x ⅜ in. and larger	3.20c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.55c. to 6c.
Shafting and Screw Stock:	
Rounds	3.45c.
Squares, flats and hex	3.95c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.63c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.28c. to 3.53c.
No. 12	3.33c. to 3.58c.
No. 14	3.38c. to 3.63c.
No. 16	3.48c. to 3.73c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	3.55c. to 3.80c.	.....
Nos. 22 and 24	3.60c. to 3.85c.	4.10c.
No. 26	3.65c. to 3.90c.	4.15c.
No. 28	3.75c. to 4.00c.	4.25c.
No. 30	4.00c. to 4.25c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	3.85c. to 4.10c.
No. 16	4.00c. to 4.25c.
Nos. 18 and 20	4.15c. to 4.40c.
Nos. 22 and 24	4.30c. to 4.55c.
No. 26	4.45c. to 4.70c.
No. 27	4.60c. to 4.85c.
No. 28	4.75c. to 5.00c.
No. 30	5.25c. to 5.50c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	—56	—40	¾-in. Butt	—30	—13
¾ in. Butt	—61	—47	1½-in. Butt	—32	—15
1-3 in. Butt	—63	—49	2-in. Lap	—27	—10
3½-6 in. Lap	—60	—46	2½-6-in. Lap	—30	—15
7-8 in. Lap	—56	—34	7-12-in. Lap	—23	— 7
9-12 in. Lap	—55	—33			

Steel Wire

BASED PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¼c. to 17½c.
High brass wire	17¼c. to 17½c.
Brass rod	14¾c. to 15 c.
Brass tube, brazed	26 c. to 27½c.
Brass tube, seamless	18½c. to 19 c.
Copper tube, seamless	21¼c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21c. to 21½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb.	$6.05	$5.80
		90 lb.	6.15	5.90
		100 lb.	6.25	6.00
IC	$10.00	$8.50	IC	6.40	6.15
IX	11.25	10.00	IX	7.40	7.15
IXX	13.00	11.50	IXX	8.40	8.15
IXXX	14.75	13.25	IXXX	9.40	9.15
IXXXX	16.25	15.00	IXXXX	10.40	10.15

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	10.00

Tin

Straits, pig	35c.
Bar	40c. to 45c.

Copper

Lake ingot	16 c.
Electrolytic	15¾c.
Casting	15¼c.

Spelter and Sheet Zinc

Western spelter	6½c. to 7c.
Sheet zinc, No. 9 base, casks	10½c. open 11c.

Lead and Solder*

American pig lead	5¾c. to 6¼c.
Bar lead	6¾c. to 7 c.
Solder, ½ and ½ guaranteed	24c.
No. 1 solder	22c.
Refined solder	18c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c.
Commercial grade, per lb	35c.
Grade D, per lb.	25c.

Antimony

Asiatic	6¼c. to 6½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	26c. to 28c.

Old Metals

The market is weak and business is at a standstill. Dealers' buying prices are nominally as follows:

	Cents Per Lb
Copper, heavy crucible	11.00
Copper, heavy wire	10.25
Copper, light and bottoms	8.00
Brass, heavy	5.50
Brass, light	4.50
Heavy machine composition	7.75
No. 1 yellow brass turnings	5.25
No. 1 red brass or composition turnings	7.25
Lead, heavy	3.75
Lead, tea	2.50
Zinc	2.50